



An Irish naturalist in Cuvier's laboratory. The letters of Joseph Pentland 1820–1832

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Introduction

The figure of Georges Cuvier,¹ Professor of Anatomy at the Jardin du Roi in Paris for almost exactly 30 years, looms large in the history of zoology and geology. Cuvier was a great anatomist, indeed perhaps the first great comparative anatomist; he was the first to describe a host of living and fossil vertebrate species, the first to attempt the reconstruction of extinct vertebrates from their skeletal remains, and the first to attempt to predict the character of missing bones from an incomplete skeleton. The theory he formulated to account for extinctions, that the Earth had suffered a series of 'revolutions' or catastrophes each involving the annihilation of the entire animal faunas (or the greater part of them) bulked large in the thinking of geologists during the early part of the nineteenth century. In consequence, Cuvier has received a great deal of attention from historians of science. Many of his letters have been published (Silbermann, 1833; Marchant, 1858; Viénot, 1905), and a series of biographies of very variable quality have been written about him (Duvernoy, 1833; Lee, 1833; Anon [Parker], 1844; Flourens 1858, 1861; Demoulin, 1881; Blainville, 1890; Hamy, 1906; Roule, 1926; Daudin, 1926; Viénot, 1932; Coleman, 1964; Anon, 1970*b*; Ardouin, 1970), as well as many shorter articles (e.g., Anon, 1970*a*). In addition, Cuvier and his ideas are discussed in all major histories of biology and geology and even figure in many works on philosophy.

Strangely enough, however, the fact that Cuvier had, for a number of years, a British assistant has consistently escaped attention. Joseph Pentland worked more or less continuously with Cuvier between 1818 and 1822 (and perhaps later), becoming a trusted and valued associate; he was working in Paris at the time of Cuvier's death on 13 May 1832, and he prepared a posthumous catalogue of Cuvier's collections (Pentland, 1832), which survives in the library of the Institut de France. It is clear that he acted as liaison between Cuvier and English scientists and that he not only arranged the shipment of casts and specimens from Paris to museums in Britain, but also procured many specimens for the museum of the Jardin du Roi (now the Jardin des Plantes). He also aided Cuvier in dissections and in the preparation of descriptions of newly discovered animals, living and fossil, and acted as cicerone for English-speaking visitors to Cuvier's laboratory. Despite all this activity, his name does not figure in any of the biographies of the great French scientist and the former existence of this connecting link between British and French science has been forgotten.

In 1970 a series of letters by Pentland, written to the great English geologist William Buckland (1784–1856), was advertised for sale by the bookseller Anthony D. Lilly of Hythe, Kent. An immediate telephone inquiry resulted in their being sent for examination to one of us (W.A.S.S.); their interest was immediately apparent. As a consequence of the intercession of Professor the Lord Energyln of Caerphilly, the letters were purchased by the Library Committee of the University of Nottingham, in whose Manuscripts Collection they are now lodged, and were made available for transcription. Subsequently (April, 1972) two letters from Pentland to Buckland were discovered in the collection of Dr and Mrs Victor A. Eyles of Great Rissington,

Gloucestershire.² Two further letters, one written to Pentland by an English lawyer and one written by Pentland to Cuvier, were located in the archives of the Institut de France; and four other letters, three written to and one by Pentland whilst he was in Paris at a much later date, were found in the National Library of Scotland and the archives of the University of St Andrews. All these letters are published in full in this paper.

Three letters from Pentland to the English geologist Thomas Webster have previously been published (Challinor, 1961), as has part of a letter to the Irish assyriologist Edward Hincks (Davidson, 1933 : 99); in neither instance was any biographical information about Pentland furnished. Unpublished letters by Pentland are contained in the collections of the Royal Botanic Gardens, Kew, the Owen Collection in the General Library of the British Museum (Natural History), the Royal Geographical Society, the library of the University of St Andrews, and the Archivo Nacional de Bolivia, La Paz. It is hoped, in the future, to transcribe and publish these letters also; they all date from later periods in Pentland's life.

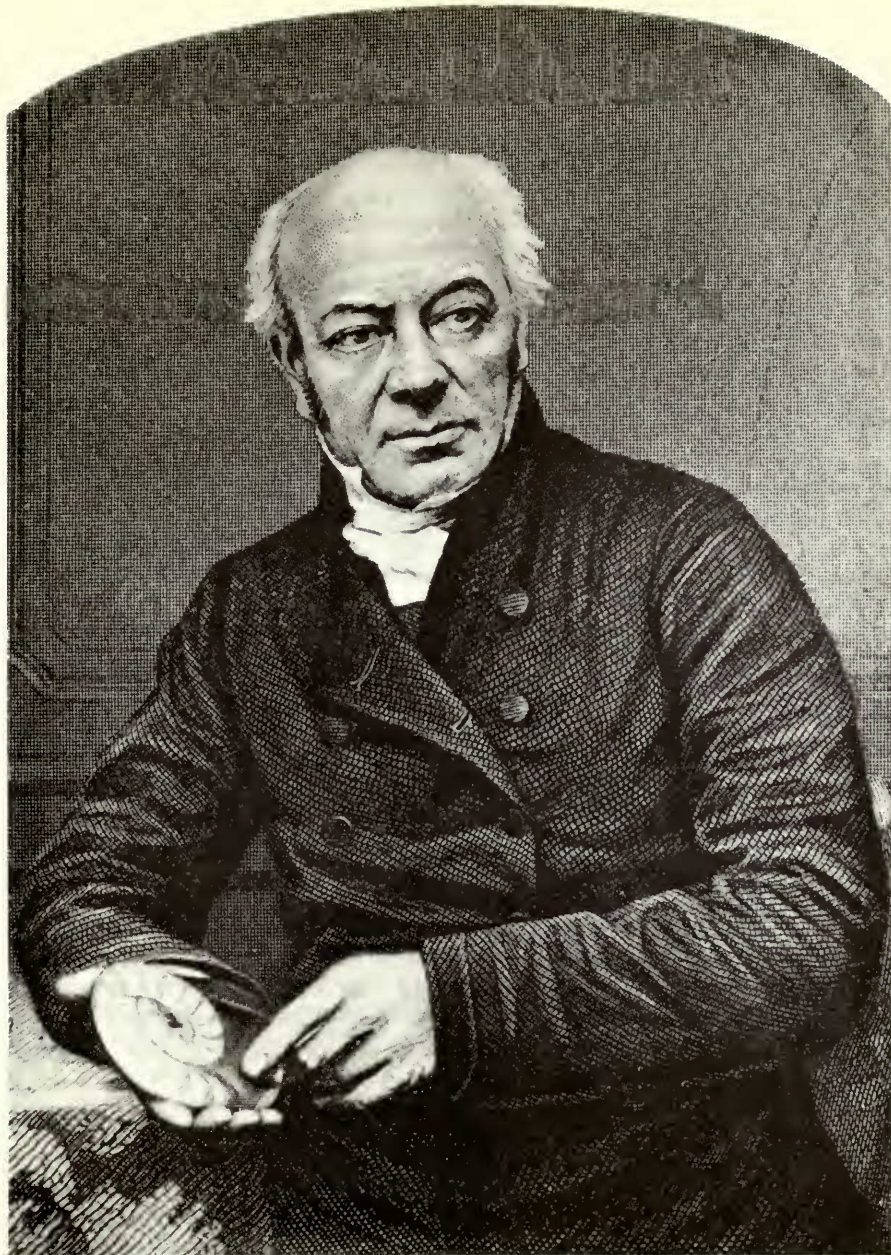
Joseph Pentland: a biography

This biography is based on the obituary notice in *The Athenaeum* (Anonymous, 1873), the Pentland entry in the *Dictionary of National Biography*, (B[oa]se] G.C., 1895) and on details given in the letters published here. In addition, the addresses from which his later letters were written have been used in determining his later movements.

Joseph Barclay Pentland was born at Ballybofey, County Donegal, Ireland, on 17 January 1797 and was early left an orphan;³ from the letters, however, it is clear that relatives took him under their wing and continued to finance his studies and investigations for many years. He was educated at Armagh Academy and thereafter at the University of Paris; in his letters, he notes that he began studying mineralogy and crystallography under Haüy,⁹² and chemistry under Gay-Lussac⁹⁸ and Thénard,¹⁰⁰ working for 12 months with the latter (see p. 273). He then went on to study geology at the Ecole des Mines, under the guidance of Cordier,¹⁰¹ Brochant de Villiers⁸⁴ and the elder Brongniart⁵⁶, afterwards undertaking an extensive geological tour in central and southern France in which he travelled 'near 2500 English miles' (p. 273). On the basis of the rocks he saw and the fossils he found, he developed 'a decided taste for Geology' (*idem*) but concluded that a sound knowledge of zoology was essential to a palaeontologist; accordingly, on his return to Paris, he commenced studying with Cuvier, probably around 1818. By 1820, when the correspondence documented here begins, he had progressed to the point where he was ranked, not just as Cuvier's assistant, but also as his friend and confidant.

His principal correspondent, William Buckland, was perhaps the most distinguished scientific polymath of the Victorian period. After taking Holy Orders in 1809, he engaged almost wholly in geology during the ensuing decade, making extensive field tours; in consequence, he was appointed Reader in Mineralogy at the University of Oxford in 1813 and was made its first Professor of Geology in 1819. He was one of the original 13 founder members of the Geological Society of London and was its President at the time it gained its royal charter in 1824, serving for a second term in 1840. He was the first Honorary Member of the (later Royal) Agricultural Society and the second President (in 1832) of the British Association for the Advancement of Science. Among his many other scientific distinctions were Honorary Membership of the Royal Society of British Architects and of the Institution of Civil Engineers. In addition to his work in geology and the associated sciences of palaeontology and spelaeology, Buckland investigated land drainage systems and pioneered the use of mineral fertilizers in agriculture, undertook work in pisciculture and archaeology and studied the ecology of land snails. In 1845 he became Dean of Westminster and, during his tenure of this appointment, not only undertook restoration work in the Abbey and reorganized the choir school but also successfully redesigned part of London's sewage system! Even by 1820, Buckland had already attained prominence in English science; he had indeed been elected Fellow of the Royal Society as early as 1818 (he served as its Vice-President from 1832–1833). Unquestionably Buckland was a most useful friend for a young naturalist to have.

How Pentland came to be friendly with Buckland is not clear. They certainly met when



William Buckland holding an ammonite; from an engraving.

Buckland visited Paris during June, 1820, since, in a letter to the geologist Thomas Webster⁴ on the 19 June of that year (Challinor, 1961 : 182), Pentland wrote:

Mr Buckland has passed 6 days here on his way to Auvergne; he has perfectly cleared up every point relative to the formations between chalk and Transition formation, he is held here in a very high point of view. I assure you when I spoke to him of yr. paper on the Isle of Wight, he told me that it was one of the best in the collection of yr. Transactions. . . .

Buckland's account (Gordon, 1894 : 37-39) of his dinner with Cuvier on this visit contains no mention of Pentland; perhaps the latter was not present, perhaps he was not important enough

to warrant mention. More surprising is the fact that Pentland did not meet Conybeare, who was Buckland's companion on this Continental tour.

William Daniel Conybeare (1787–1857) was Buckland's close friend and a fellow cleric, as well as an enthusiastic and competent geologist who travelled widely with Buckland on geological tours and whose work on fossil reptiles is extensively discussed in these letters.

Pentland had apparently met Webster on a brief visit to England earlier in the same year, since a letter introducing him to Webster survives. The letter was written by another Englishman, Thomas Richard Underwood (c. 1765–1836). Underwood was a talented artist, who had exhibited a total of 23 landscapes at the Royal Academy between 1789 and 1801. He had lived in Paris since the time of the Treaty of Amiens (March, 1802), at first as a prisoner on parole; later he attracted the favour of the Empress Josephine and thereafter enjoyed the freedom of Paris. He seems to have been a dilettante of mercurial temperament and has been described as 'an acquaintance of Coleridge's, a friend of Fuseli's, an antiquary, but ardent for the latest fashion in politics and morals; a flaming democrat and an admirer of Napoleon' (Treneer, 1963 : 79). He is principally remembered for his association with Sir Humphry Davy (1779–1829), the great chemist, and figures in most biographies of that scientist. John Davy (1836, 1 : 147), said he was 'an artist of some talent, with a fondness for science, from whom Dr Paris [Davy's earliest biographer] seems to have received many unfavourable notices of my brother, incidents and anecdotes which, even if true, no true friend would have communicated of another' and also noted that Sir Humphry 'ceased to esteem Mr Underwood in the latter part of his life.' (Davy 1836, 1 : 50). Challinor, in his commentary on Underwood's letters to Thomas Webster, commented that 'It would no doubt have been better for Webster if Underwood had not sided with him so ardently and inflamed his grievances, real or imaginary, with, at times, such violent expressions' (Challinor, 1961 : 182). This very violence of expression is evident in Underwood's references to Pentland; though he had originally introduced Pentland to Webster as 'a particular friend of mine' (Challinor, 1961 : 184) he later says in a letter written in December 1821:

... if what I have done furthers your truly scientific inquiry and will assist you to defeat a band of busy, jealous, active & revengeful witlings, do not fear I will relax my exertions. They have gained and kept their ascendancy partly from the contempt, partly from the indolence of others, and they think that the forbearance of men of science has arisen from want of power to do justice to themselves or to make reprisals in the quarters of their enemies. This band has an active agent here but he begins now to be pretty well known, and has long been suspected, I mean that lying thief (I mean what I write) Pentland, who is in constant correspondence with Buckland & Conybeare, to who he communicates all he can pick up at Cuvier's (Challinor, 1961 : 193).

Though Pentland himself wrote relatively little about Underwood, his mentions of the latter suggest mixed feelings, at very least; certainly it is clear that he did not view Underwood with unalloyed esteem. As will be seen, Pentland's letters to Buckland contain nothing that gives credence to Underwood's unpleasant imputations.

From the date of his first letter to Buckland (June 1820) until March 1822 (when he set off with a friend on a tour into Italy), Pentland remained continuously in France; though visits to England were repeatedly contemplated (see pp. 272 & 276), none was made. During this time, he was beginning to try to establish himself in a career; he was offered the post of Assistant Surgeon with the Honorable East India Company, but ultimately declined it (p. 289) and he also investigated the possibility of a post in New Holland (Australia) (p. 277), but did not follow this up. Several letters refer to his interest in an appointment as naturalist at the British Museum but, though he wrote at length to Buckland about this as early as 3 December 1821, unsuccessfully soliciting his support (pp. 285, 288–9) and later registering indignation when it was not forthcoming (p. 290), Pentland was curiously dilatory about actually submitting a formal application and had not done so even by March 1822. Indeed, we have found no evidence that he ever *did* submit an application. Perhaps for this reason (for Pentland was certainly extremely well qualified for the British Museum appointment and Cuvier's endorsement of his candidature should have carried great

weight), he did not obtain the post and was again working with Cuvier when the last letter of the main sequence was written, in February 1824. An offer of an appointment by the Russian Government had in the meantime been declined on patriotic grounds (p. 272), a decision which Pentland may well have regretted when no British appointment was forthcoming.

Pentland was, at this time, still apparently being supported by his relatives, since he had to seek their approval before going to Italy (p. 294). They seem to have considered his activities not altogether respectable; this is surely the only reasonable explanation for his unwillingness to be referred to in Conybeare's work on ichthyosaurs (p. 274), which in turn accounts for the fact that his significance in the early studies of fossil reptiles has hitherto passed unrealized (see Delair & Sarjeant, 1975). The financial support he was receiving seems to have been ample, since he observed, with slight disdain, of another young naturalist that he was 'poor as a Church Mouse' (p. 286). There is no indication that he was receiving any salary for his work for Cuvier; the fact that he worked so long and so hard⁵ therefore indicates the profundity of his interest in natural history and the excitement he felt about the work he was doing.

Although he apparently did not return to England during the period covered by these letters, Pentland was not continuously in Paris; he mentions having travelled, on a bone-quest, to Nice and Ceuta in the Winter of 1820 (p. 284) and his plans for an extensive tour in Switzerland and Italy in 1822 are discussed at length (pp. 293 & 296). Whilst on this tour, he must have written several times to Buckland and to Cuvier. A single letter written to Cuvier from Florence (pp. 297 & 300) has been located; it shows the vigour with which Pentland was prosecuting his osteological researches on his mentor's behalf. Since Buckland quoted Pentland as the source for the data on the Val d'Arno and on the mammalian fossils in Florence museum quoted in *Reliquiae diluvianae* (1823 : 26, 182), it is clear that his correspondence with Pentland continued after the date of the last letter here transcribed; only one later letter, dated 28 February 1824, has been located. In this last letter (p. 304), Pentland outlined plans for a brief visit to England and a lengthy winter stay (1824–25) in Sicily; evidently he was already acquiring the strong affection for Italy which was to be a major factor in his later life.

Pentland's letter reports his discovery of an almost complete bear's skull in the Florence museum. This find, and its significance, were discussed in the notebooks of the pioneer spelaeologist Father John MacEnery:⁶

2 fragments of anomalous species of Bear were found in Tuscany which Cuvier provisionally named as the Etruscan Bear — but the researches of Mr Pentland an English naturalist of great eminence led to the discovery of an entire head in the museum of Florence which has been raised from the bed of the Val d'Arno and determined the species of the Etruscan Bear— by degrees it began to reveal itself and an analogous tooth to those *previously* found in this cavern⁷ was discovered in the cave of Lunei near Montpellier. The resemblance of the tusk to a blade made Cuvier change the local name of Etruscan to the more general and characteristic appellation of *cultridens*⁸ . . . (Alexander, 1964 : 132, 133).

Perhaps during his visit to England in 1824, perhaps during 1825 or 1826, Pentland had the opportunity to study some mammalian remains from north-east Bengal and to examine rocks from India in the Geological Society's museum. The results of this work, conveyed in the form of a letter to the English geologist W. H. Fitton⁹, were presented to the Geological Society on the 2 May 1828. The discovery of a new species of *Anthracotherium*, *A. silistrense*, was reported, but no figures were provided (Pentland, 1828). He was also engaged at about this time in a detailed examination of fossil fishes from the sediments of Caithness later shown to be of Devonian date, which had been sent to Cuvier for examination and passed by him to his assistants. Pentland's work on these was acknowledged and quoted in a joint paper on those strata by Sedgwick and Murchison, read to the Geological Society of London on 16 May and 6 June 1828.

Before this, Pentland had at long last found the means of fulfilling his desire to travel to distant lands. In 1826–1827, he travelled to South America with Woodbine Parish¹⁰ on an exploratory expedition to the Bolivian Andes, an area previously little visited by Europeans. His geographical and geological discoveries were of great importance. He took extensive observations on the

position of the snowline, discovering the mean position of the permanent snowline to be 16,990 ft (5100 m). He was also the first to recognize the height of the Bolivian Andes, finding the mean height of the practicable passes, even, to exceed 14,650 ft (4400 m) and determining the altitude of the major peaks—Gualtieri (22,000 ft, 6600 m,) Arequipa (18,300 ft, 5490 m), Chirquibamba (21,000 ft, 6300 m), Illimani (21,300 ft, 6390 m) and Sorata (24,800 ft, 7440 m) (Pentland, 1835, 1838; Arago, 1830). (These measurements have since been corrected: Mt. Arequipa, now known as El Misti, to 19,110 ft [5733 m], Illimani (Bolivia) to 21,184 ft [6355 m] and the higher of the two peaks of Sorata to only 21,490 ft [6447 m]). He noted that the majority of the peaks were volcanoes, extinct or dormant, but that sedimentary rocks were also present at great altitudes; for he found Silurian fossils at 17,000 ft (5100 m) and a Carboniferous limestone at 14,000 ft (4200 m). He visited Lake Titicaca, noting that the Rio Desaguadera was its outlet (all earlier maps show this river running *into* the lake).

As a result of this journey, he secured his first diplomatic appointment, as secretary to the Consulate-General in Peru (1827). His tenure of this appointment was, however, quite brief; and by early 1828 he was back in Europe. The course of his researches during that year can be traced unusually fully, from two accounts in the *Transactions of the Geological Society of London*. In May 1828, W. H. Fitton¹¹ read to the Society a letter from Pentland, reporting on the studies that Pentland had made of bones in the Society's Museum. These were from Cooch-Behar, India, and constituted the first fossil mammalia to be brought back from south-east Asia. Pentland noted that they comprised:

1. One species of the genus *Anthracotherium* of Cuvier.
2. A small species of Ruminant allied to the genus *Moschus* [the musk-deer],
3. A small species of herbivorous mammal referable to the order Pachydermata, but more diminutive than any of the fossil or living species; and
4. A carnivorous animal of the genus *Viverra* [the civet].

Pentland was by that time back in Paris; and soon afterwards he was engaged in examining some fishes from the Old Red Sandstone of Caithness, Scotland, sent to Cuvier for study by the distinguished geologists Sedgwick¹² and Murchison¹³. Pentland almost certainly helped prepare the drawings and descriptions of, and may even have chosen the names for, the new species described in the accounts given to the Geological Society on 16 May and 6 June of that year; if so, a continuing desire for self-effacement may again have prevented him from taking more explicit credit for his work (Sedgwick and Murchison [1828], 1835).

A letter from Paris in July 1829 (Challinor, 1963 : 293) attests to Pentland's continuing residence in that city; and in 1830, the surgeon and palaeontologist Gideon Algernon Mantell (1790–1852) noted in his journal:

March 20 . . . Mr Pentland writes me from Paris that Baron Cuvier has presented to him for me a cast of the celebrated head of the Mosasaurus that Hoffman found, the Canon stole, and the French revolutionary army plundered and sent to Paris where it still remains—the glory of the Organic Rem^s [Remains] of a former world, as poor Parkinson¹⁴ has it. What a noble addition this will make to my museum.

May 1 . . . Sent a box of fossils to Mr Pentland by the steam-packet; and papers to Baron Cuvier, M. Prevost,¹²⁵ Brongniart⁵⁶ etc. (Curwen, 1940 : 75, 77)

On 17 February 1830, an account of the geology and fossils of the Hunter's River district of New South Wales was presented to the Geological Society of London (Cunningham [1831] : 255–256). A series of bones from a calcareous breccia cropping out in this region was at about this time presented to Cuvier for examination; they had been collected by Major Mitchell,¹⁵ then Deputy Surveyor-General for the colony of New South Wales, and were transported to Paris by Professor Jameson of Edinburgh.¹⁶ Pentland reported on them to the newly formed Société Géologique de France at a meeting later in 1830. Eight species of vertebrates were considered to be represented: seven of them, reasonably enough, were marsupials, attributed to the genera

Hypseprunus, *Thylacinus*, *Macropus*, *Halmaturus* and *Phlaeomys*, but the eighth, thought to be a species of elephant or mastodon and represented only by an incomplete femur, appeared surprising then and seems quite incredible now! (It may well have been an incomplete femur of the then unknown giant marsupial *Diprotodon*). Pentland noted that, with this single exception, the skeletal remains confirmed Cuvier's law that 'in each continent all the extinct species of mammals belong exclusively to genera still existing on these continents' (transl.) (Pentland, 1830). Pentland gave an account of the collection in a letter to Jameson written on 22 April 1831; when this was published, however, it was erroneously credited to Mitchell (Pentland, 1831). A fuller account of the discovery was published in 1832, when the bones were returned to Scotland and deposited in the Edinburgh College Museum (Pentland, 1832).

A mention in a letter to Gideon Mantell, 10 October 1830 (Lyell, 1881, 1 : 288), by the eminent geologist Charles Lyell¹⁷ indicates that Pentland was in Paris in October 1830. Indeed, since Pentland wrote to Jameson from Paris in April 1831, was certainly there in August of the same year (see p. 306) and was there at the time of Cuvier's death on 13 May 1832, it is clear that he was working pretty continuously at the laboratories in the Jardin du Roi during these years. The osseous remains from New South Wales continued to engage his attention during this period; Mitchell had sent a further collection directly to Cuvier. An account of them was sent for publication to Jameson on 15 November 1832; once again, however, the authorship was wrongly accredited, this time to a mythical 'William Pentland' (Pentland, 1833). (As a consequence, the authorship not only of this paper, but also of two others in which Pentland's initials were not given, was erroneously attributed to 'William Pentland' in the Royal Society's list of publications and elsewhere, e.g. Simpson (1930 : 26) where the 'Major Mitchell' note is incorrectly attributed to 'W. Pentland'. After the death of his mentor, Pentland's preparation of the posthumous catalogue of Cuvier's great collection (see p. 245) brought his activities at the Jardin du Roi to a fitting close.

Pentland's extensive Italian collections, now lodged in the Jardin du Roi, had not been fully described by Cuvier, nor did Pentland himself do more than merely catalogue them. Other palaeontologists regularly visited Paris to study the collections; among them was a German, Hermann von Meyer¹⁸, who devoted particular attention to a collection of 100 bones obtained by Pentland from the ossiferous Grotta dei Beni Fratelli in Mt Bellemi, 4 miles (6½ km) west of Palermo, Sicily. Meyer found that the greatest proportion of the bones—seven-tenths of them—were those of a hitherto undescribed species of pygmy hippopotamus, 'scarcely larger than our large domestic ox' (Meyer, 1832 : 533). This species was unrepresented in the collections from mainland Italy and remains so; it was an island species, whose remains were subsequently discovered also in Crete and Malta. Meyer named it *Hippopotamus pentlandi*.

Pentland continued to reside in Paris, and presumably to work at the Jardin du Roi, during the ensuing few years; however, he travelled to Scotland to present an account of the osteology of the ancient inhabitants of the Andes at the British Association meeting in Edinburgh in 1834 (Pentland, 1835). He was again in Paris in June, 1836, but shortly thereafter was appointed by Lord Palmerston to be Consul-General in Bolivia from 1 August 1836, holding this appointment till 1839 and residing for most of this period in La Paz¹⁹. During 1838, he made a tour in the southern provinces of Peru and visited Cuzco and neighbouring localities of archaeological interest (Pentland, 1838); also during this second South American residence, he made a complete survey of Lake Titicaca, a formidable task in view of its size. (Pentland's map of the lake was engraved and published by the Admiralty in 1847).

Pentland's subsequent movements have, as yet, been only partially determined; the transcription of his later correspondence will undoubtedly clarify his movements and concerns to some degree but (since the letters only occasionally bear addresses) it is doubtful whether a detailed biographical account of his later years can ever be written. There seems no evidence that he ever again sought regular employment and it is to be presumed that he now had private resources adequate for his needs. His life continued for some years to be peripatetic. He was in Paris in 1839, probably in 1841, in 1847 and in 1848, but there is no indication of any resumption of work in the Jardin du Roi. From 1845, he made Rome his winter residence and travelled extensively in Italy, becoming indeed so well acquainted with Italian topography and antiquities that he edited

for the publisher John Murray three editions of a handbook to Rome and editions of handbooks to northern and southern Italy (Pentland, 1860, etc.). Another consequence was that he was asked to act as guide to the Prince of Wales, afterwards King Edward VII, on the latter's two visits to the city; according to Pentland's obituary in the *Athenaeum* (Anonymous, 1873), 'from him and Princess, Mr Pentland received the greatest kindness and consideration until the day of his death'. Among his other visitors there was Sir Archibald Geikie,²⁰ who journeyed to Rome in 1870, 'the year of the great Oecumenical Council', when 'the streets were crowded with cardinals, archbishops, bishops, abbots . . . gathered together from every corner of the globe'. In consequence, 'Although much tempted to linger here for a while, I had to content myself with a stay of only two or three days, during which, thanks to Mr Pentland, at that time the great resident English authority on Rome (to whom Murchison had given me an introduction), I saw the chief pagan antiquities . . .' (Geikie, 1924 : 135).

Pentland did little further work in vertebrate palaeontology, publishing only one more paper on this topic (Pentland, 1858). However, further bones he had collected from the Sicilian cave deposits were described by the eminent English vertebrate palaeontologist Hugh Falconer²¹; among them, appropriately enough, were numerous remains of *Hippopotamus pentlandi* (Falconer, 1860). Falconer's own collection, lodged after his death in the British Museum (Natural History) by his executor, contains many bones of this species (Lydekker, 1885 : 287–291). Pentland's name was also immortalized by Ours Pierre A. P. Dufrenoy (1856, 2 : 549–55), who, named the mineral Pentlandite after him. In Dufrenoy's words: 'On a récemment decouvert à Craignûre, a neuf milles au sud-ouest d'Inverary, dans le comté d'Argyle en Écosse, une pyrite qui contient une proportion assez forte de nickel. Cette variété de pyrite, qui fournit un minerai nouveau de nickel, a été dédiée au savant M. Pentland, qui l'a fait connaître . . .'

Pentland's London residence was the Union Club in Trafalgar Square. Perhaps as an eventual consequence of the fossil fishes sent to Paris some 14 years earlier, Pentland had by now become a close friend of Sir Roderick Murchison¹³; Mantell's journal for 1842 notes:

June 15—Attended the meeting of the Geological Society; an angry discussion between Owen and Dr Grant on the Mastodon and Tetracaulodon remains now exhibiting in the Egyptian Hall, Piccadilly by a Mr Kosch. Gossiped with Dr Buckland, Grant,²² Lord Enniskillen,²³ Sir P. G. Egerton,²⁴ Mr Greenough,²⁵ Murchison, Pentland, Featherstonhaugh²⁶ etc—(Curwen, 1940 : 159).

and the diary of another geologist, Ramsay,²⁷ notes:

18th February [1849]. Sir Roderick Murchison's dinner at seven . . . Sedgwick was there, Pentland, and Lockhart, Sir Walter's son-in-law . . . We had a capital evening . . . (Geikie, 1895 : 146).

Thus it is evident that Pentland was a sufficiently familiar figure in the scientific life of the city for his presence to evoke no comment; it is equally clear, however, that he was not prominent enough to be thought worthy of anything more than incidental mention! For this reason, perhaps, he is nowhere mentioned in the lengthy biography of Murchison (Geikie, 1875), even though (according to an obituary notice) he and Murchison were indeed close friends.

In general, Pentland is an elusive figure; we have been unable to find a surviving portrait of him and his later life seems likely to remain forever obscure. He seems never to have married, nor did he apparently ever revisit Ireland, the country of his birth. Presumably because of family connections, he was periodically a guest at various English country houses; an undated letter, apparently written before 1849, was addressed from Lilford Hall, near Oundle, Northamptonshire²⁸ and two letters were addressed in February, 1849, from Claverton Manor, near Bath, Somerset.²⁹ (Many of his later letters bear neither address nor postmark).

Though he apparently did not revisit it, South America continued to figure amongst his interests in these later years; he was concerned in the production of at least two geographical works dealing with that subcontinent.³⁰ Otherwise, his time and interest appears to have been divided between

Italy and London. He died at 3 Motcomb Street, London, on 12 July 1873 and was buried in Brompton Cemetery, quite close to the grave of his friend Murchison.

Cuvier and his laboratory in 1820–1822

At the time Pentland was working with him, Cuvier had already attained an international reputation. His greatest work, *Recherches sur les ossemens fossiles où l'on établit les caractères des plusieurs animaux dont les révolutions du Glôbe ont détruit les espèces*, whose publication in 1812 marks the effective commencement of vertebrate palaeontology, was in course of being greatly expanded and revised, the 'second' edition being published between 1821 and 1824. (Pentland's letters refer repeatedly to the progress of this work). The excavation of the gypsum quarries of Montmartre (whose site, later to be covered by cheap housing as Paris grew, was to become a focus for artists) was yielding a rich supply of Tertiary mammalian remains; the skeletons often were so incomplete and so intricately mixed with other bones that Cuvier's anatomical ingenuity must have been repeatedly taxed in deciding what went with what.

The absence of human remains was an especially striking feature of these deposits, so far as contemporary zoologists and geologists were concerned. Cuvier himself believed that the history of life had gone through three distinct past epochs—ages of invertebrates and fishes, of reptiles, and of mammals, each terminated by a world catastrophe—and that man did not appear till the fourth epoch. His ideas, originally expressed in a preliminary discourse to the first edition of *Ossemens fossiles*, had been published separately in an English translation (Cuvier, 1817) and profoundly influenced the geological thinking of his contemporaries; that Pentland was a whole-hearted believer in these ideas is apparent (pp. 263–264).

Cuvier's working environment is well described, at a slightly later period (it had probably changed little since Pentland's time) by Charles Lyell:

I got into Cuvier's sanctum sanctorum yesterday and it is truly characteristic of the man. In every part it displays that extraordinary power of methodising which is the grand secret of the prodigious feats which he performs annually without appearing to give himself the least trouble. But before I introduce you to this study, I should like to tell you that there is first the museum of natural history opposite his house, and admirably arranged by himself, then the anatomy museum connected with his dwelling. In the latter is a library disposed in a suite of rooms, each containing works on one subject. There is one where there are all the works on ornithology, in another room all on ichthyology, in another osteology, in another *law* books! etc. etc. When he is engaged in such works as require continual reference to a variety of authors, he has a stove shifted into one of these rooms, in which everything on that subject is systematically arranged, so that in the same work he often takes the round of many apartments. But the ordinary studio contains no bookshelves. It is a longish room, comfortably furnished, lighted from above, and furnished with eleven desks to stand to, and two low tables, like a public office for so many clerks. But all is for the one man, who multiplies himself as author, and admitting no one into this room, moves as he finds necessary, or as the fancy inclines him, from one occupation to another. Each desk is furnished with a complete establishment of inkstand, pens, &c, pins to pin MSS together, the works immediately in reading, and the MS in hand, and on shelves behind all the MSS of the same work. There is a separate bell to several desks. The low tables are to sit to when he is tired. The collaborateurs are not numerous, but are chosen well. They save him every mechanical labour, find references &c., are rarely admitted to the study,³¹ receive orders, and speak not . . . I found that the man who makes moulds,³² and the *painter* of them, had distinct apartments, so that there was no confusion, and the despatch with which all was executed was admirable. It cost Cuvier a word only. (Lyell, 1881, 1 : 248–251).

Cuvier had by now attained the unquestioned position of foremost anatomist and zoologist



Cuvier, here seen holding a slab showing the impression of a fossil fish. Engraving by Chollet, after Giraud. Photograph: Roger Viollet. (Reproduced by courtesy of Expansion Scientifique Française, Paris and M. Paul Ardouin).

in Europe; in consequence, his laboratory was a focus for visitors and his dinner-parties and Saturday-evening *soirées*:

. . . were the most brilliant and interesting meetings in Paris. There passed in review the learned and the talented, of every nation, of every age, and of each sex; all systems, all opinions were received; the more numerous the circle, the more delighted was the master of

the house to mingle in it, encouraging, amusing, welcoming everybody, paying the utmost respect to those really worthy of distinction, drawing forth the young and bashful, and striving to make all appreciated according to their deserts. Nothing was banished from this circle but envy, jealousy, and scandal; and this saloon might be compared to all Europe. It was at once to see intellect in all its splendour; and the stranger was astonished to find himself conversing, without restraint, without ceremony, with or in the presence of the leading stars of Europe: princes, peers, diplomatists, and the worthy savant himself, now receiving these, and now the young students, from the fifth pair of stairs in a neighbouring hotel, with equal urbanity. No matter for him in which way they had directed their talents; what was their fortune—what was their family; and wholly free from national jealousy, he alike respected all that were worthy of admiration. He asked questions from a desire to gain information, as if he too were a student; he was delighted when he found a Scotchman who spoke Celtic: he questioned all concerning their national institutions and customs; he asked the traveller an infinity of things, well knowing to what part of the world he had directed his steps and seeming to think that everyone was born to afford instruction in one way or other, he elicited information from the humblest individual, who was frequently astonished at his interest in what seemed so familiar to himself. One thing used particularly to annoy him—which was, to find an Englishman who could not speak French. It gave him a restraint, of which many have complained; but which, on these occasions, solely arose from a feeling of awkwardness on his part, as not being able to converse with his foreign guest. (Anon [J. W. Parker], 1884 : 91–92).

Virtually every scientist visiting Paris attended these soirées of Cuvier's; Pentland thus had opportunity to meet most of Europe's distinguished scientists and certainly came to know well the savants of Paris, as his letters make abundantly clear. He repeatedly mentions English visitors and several times sent on, with letters of introduction provided at Cuvier's instigation, foreign scientists who had visited Paris before travelling to London (e.g. p. 307).

In quest for zoological and palaeontological specimens, Cuvier was in correspondence with diplomatists, naturalists and collectors in many parts of the world; Pentland's letters frequently note the arrival of shipments. In February 1814, Cuvier had married a widow, Anne-Marie Duvaucel, née Coquet de Trazaille, whose husband, Louis-Philippe Duvaucel, had gone to the guillotine in 1797. He son, Alfred Duvaucel (1792–1824), travelled out to India in December 1817, along with another young Frenchman, Pierre-Médard Diard (1794–1860) to collect specimens for Cuvier. Duvaucel and Diard organized a museum at Chandernagor, but were invited by Sir Stamford Raffles,³³ who was then the British governor of Benkulen in Sumatra, to collect in that island at Raffles' expense. It was agreed that the resultant collections should be divided into two parts, one part to go to Sir Stamford Raffles and the Honorable East India Company, and one part to go to Cuvier in Paris. The two Frenchmen duly travelled to Sumatra and amassed a fine collection, but on 4 February 1819, whilst being readied for shipment, both parts of the collection were seized by the Honorable East India Company at Raffles' instigation³⁴—an incident which is discussed by Pentland, who clearly reflects Cuvier's indignation (p. 266), and which may well have been the subject of the lawyer's letter, unfortunately incomplete, quoted on p. 257. However, it is evident that Raffles and the East India Company did not obtain all the items from the collection, since Pentland's letters make it clear that some duplicate specimens from it eventually reached Cuvier in Paris (see p. 266). Whether Duvaucel and Diard were officially allowed to retain these duplicates, or whether they were smuggled out, is not clear.

Much vexed by the incident,³⁵ Duvaucel returned alone to Calcutta; shortly afterwards, however, he travelled to Sumatra (this time at his own expense) and succeeded in collecting for Cuvier further specimens to duplicate some of those that had been seized. The resultant collection was safely shipped to Paris; its arrival is recorded by Pentland (p. 281).³⁶ Duvaucel then returned to India and undertook further collecting trips on the behalf of his stepfather—around

Dacca, in the Ganges valley and the foothills of the Himalayas, and along part of the course of the Brahmaputra. After returning to Calcutta to prepare for an expedition to Tibet, he fell ill and died prematurely in Madras in August, 1825. Diard was more fortunate. He travelled in Cochin-China in 1821, being one of the earliest European visitors to Angkor. For a while, he continued to ship specimens to Cuvier; later (1824) he worked in Batavia, Java, as a collector for the Leyden Museum; he became a Chevalier of the Dutch Order of the Lion and of the French Legion of Honour, dying in 1863 after accidentally poisoning himself with arsenic employed in taxidermy.

It is important to stress that, during the period in question, Cuvier was not only prominent in scientific circles but also in French politics. He was appointed Councillor of State by Napoleon in 1813; after the Restoration, he was confirmed in this appointment by Louis XVIII and, in 1819, was made President of the Comité de l'Intérieur. Pentland records, in passing, some of Cuvier's political preoccupations, noting for example that 'discussion of the Budget in the House of Deputies has taken up all his time for the last 3 weeks' (p. 272) and mentions himself escorting Madame Cuvier to the opening of the Chamber of Deputies (p. 283). Cuvier was made a baron in 1819, became interim Grand-Master of the University of Paris, and figured prominently in the coronation ceremonies for Charles X. Although he lost both appointments in the ensuing political reshuffle, he was again made a baron by King Louis-Philippe in 1831 and again become Grand-Master of the University. When his other activities are considered, Cuvier's scientific productivity, throughout the years of his association with Pentland, is truly remarkable.

Editorial notes

The letters which follow are arranged chronologically, so far as possible. In some instances, Pentland dated them legibly himself; others show a clear postmark; yet others have pencil dates added by some previous owner (in these instances, internal evidence supports the pencil date). A small residue of the letters bear only an illegible date or no date at all; usually they can be placed into order on the basis of internal evidence, but in one instance (the lawyer's letter) two dates are possible (even though the earlier seems more likely, for reasons stated). In view of the occasional uncertainties concerning their dates, the letters are numbered to facilitate ready reference.

The letters were originally transcribed without amendment, but their punctuation (or, rather, their lack of it) posed problems in comprehensibility, sentences often showing no subdivision into clauses and being separated from one another by colons, commas, or not at all. To add to the problems, new sentences were only rarely begun by initial capitals. The punctuation here given is thus largely imposed by the editors; Pentland's colons have usually been left, but his commas have in general been replaced by fullstops and virtually all commas herein have been inserted by the editors. Pentland strewed capitals rather arbitrarily; his capitalisation is reproduced herein without comment!

The archaic 'ye' has been replaced by 'the' wherever it occurred and the long 's' has been eliminated. Words or letters missing as a result of error, but clearly implicit in the construction of the sentence, are inserted in square brackets. The word 'Ichthyosaurus' is consistently spelled as 'Ichtyosaurus' by Pentland and the word 'courier' as 'courrier'; these mis-spellings have been allowed to stand without comment, since they occur with such frequency. All other erroneous or unusual spellings, and all other faulty sentences whose intended meaning is not clear from the context, are reproduced without alteration but indicated by '[sic]'. Some words were in varying degree illegible; where an intelligent guess could be made but complete certainty was impossible, they are followed by '[?]'. All deleted sentences and words are reproduced, inside square brackets, unless illegible; some proved of great interest!

In the attempt to identify persons mentioned in the letters, over 100 volumes were consulted at different times. For reasons of space, these are not listed here save in instances where a direct quotation was necessary for other reasons.

The letters

I The first letter here quoted (in the collection of the Library of the Institut de France, Paris, carton 3252, piece 98) is the most puzzling in terms of date: it is incomplete and we have not succeeded in identifying its author. However, since the subject might well be Sir Stamford Raffles' seizure of Duvaucel's collection (see p. 255), the earlier of the two possible dates is considered more probable:

2 Old Square Lincolns Inn
1st February 1820 (or 1830?)

My dear Pentland—I have been unfortunately prevented from answering your letter before—for which I beg to apologise to you and M. Cuvier. The law upon the subject you asked of [deletion] is as I believe as follows—

Whenever a contract is made between a board such as the Navy Board & any other public officers—if the contract is made between the contractor and the ['board' deleted] board without any express provision—the Board or Officers of Government are liable to the Contractor as private individuals and any dispute or contest between them and the Contractor is settled in the Courts of Law, in the same was [*sic*: 'way' presumably intended] as a dispute between any two individuals. The action is brought before the ordinary Courts of Law in the usual manner—By the Board or other officers against the contractor to compel him to perform his contract or to obtain the damages occasioned by his not performing it—Or by the contractor against the board or officers who made the contract with him to compel them to pay him what is due to him—As the case may be—.

In order however to [deletion] avoid personal liability attaching to the Officers of the Government who enter into contracts—it is now however most usual to introduce into all contracts made by them an express stipulation—'that they the Officers or board are not to be personally liable although they have entered into the Contract' [lengthy deletion]. When this is the case the Contractors have no remedy against the Board who enter into the contract with them.—The only remedy they have is by a suit against the Crown directly by a proceeding called a *petition of Right* in the Court of Chancery.—This proceeding although differing in point of form from ordinary actions [lengthy deletion] is decided upon the same principles as ['are' deleted] any ordinary action between subject and subject—the only difference is in the form of the proceedings The Crown however proceeds in the ordinary courts of justice . . . *against* the contractors in the same way an individual would proceed against them—except that the action is brought in the name of the Attorney General—but in all ['other' Deleted] respects the Cerown proceeds against Contractors and other persons dealing with it, in the name of the Attorney General in the Ordinary [*sic*] Courts of Justice and before a Jury as any one subject would sue another for breach of contract.

I should however observe that all these proceedings are usually instituted in the Court of Exchequer—but that makes no difference as the Court of Exchequer proceeds ['in' deleted] with a jury as the other Courts do—and is not a Court confined to these proceedings only but also decides the same disputes between Subject and Subject and is [deletion] a court open to all the public and for all cases in the same manner as the other Courts.

[Letter incomplete]

All subsequent letters are written by Pentland himself. All but three of them are preserved in the Manuscript Collection of the University of Nottingham; the three additional letters are placed in sequence, but they are distinguished, and their lodgment indicated, in footnotes.

II

Franked '20 Ju 1820', Bath

My dear Sir,

I have just received your two letters with that of Mr Conybeare [p. 248] enclosed, which I shall sent back to you as soon as Mr Cuvier has read it.

I am very glad that Mr Conybeare and Delabeche³⁷ are using all their efforts to make known the fossil remains of the Lias, but I fear they are not sufficiently au fait of the Osteology of the Saurian Tribe [‘which’ deleted] and especially that of the head, which is the most difficult point of Comparative Anatomy, to establish that concordance between the lost and living species which Mr Conybeare seems to suppose in his letter. You know that we have a good many specimens³⁸ here at [sic], many of which we owe to your kindness, and, from every consideration, I am sure that the fossil species approaches much nearer to the family of Lacertians of Cuv. or to that family which embraces or contains all the Saurians except the single genus Crocodilus. It is not the Saurian family alone which has its underjaw, the other Reptiles are in the same category: [‘but’ deleted] the manner of articulation with the Cranium is also by means of a detached portion of the Temporal bone, which Mr Cuvier considers as the analogue of the quadratum of Birds: but if we wish to search to what particular class of reptiles the fossil animals have belonged and not remain contented that they are merely Saurians, the examination of the Sternum and of the Sterno-Humeral System clearly proves [sic] that they approach very near to the Monitor, Iguana and Lacerta genera. The form of the extremities and composition of the principal locomotive organs will finally prove that the Ichtyosaurus forms a distinct family in the Saurian orders,³⁹ much nearer allied to our common Lizard, Monitor etc. than the to the Crocodile, but distinct by being entirely adapted to an aquatic abode.

As to pretended resemblance between the nasal opening of the Proteosaurus with those of the Porpess [sic], I think that there must be some mistake. The Porpess (*Delphinus phocoena*),⁴⁰ Like all the other Cetacea, have [sic] but one large nasal opening divided by a bony septum, and through which the Animal blows the water which he is obliged to take into his mouth with his food; it is the only way of his getting rid of it. The opening is situated near the summit of the head, and surrounded by the Nasal, Maxillary and Intermaxillary bones, so that there can be no doubt as to its identity with the anterior opening of the Nostrils of the other Mammalia; now it is very well established that no other opening exists, and that the narrow slit of which you speak is observed in a dried head of a Porpess or of any other Dolphin, can be nothing else that [sic] what separates the intermaxillary bones, and which in the recent state is filled by soft parts and has no outward opening. Besides it is very well proved today that the Cetacea have no power of Smelling, as the first pair of nerves which are distributed to the nostrils do not exist or are so small as to have hitherto escaped the eye of the Anatomist, and that in those animals the sense of smell is sacrificed for a more important one, that of acquiring its nourishment [sic].

I must also reclaim the priority of the discovery of the composition of the lower jaw and its division into 6 separate bones for Mr Cuvier or rather for Mr Laurillard;⁴¹ indeed, from the moment of the arrival of Col Birche’s⁴² specimens in July last, no one here doubted of it and I think I spoke to you of it during yr. last stay in Paris. I think they wd. do well at least to say so in a note, as if not Mr Cuvier will one day be obliged to reclaim against their discovery. I even, during my last visit to London, pointed out the same, or at least told both Leach⁴³ and Clift⁴⁴ that such must be the case, from the form & composition of the Head: The dentition of the Ichtyosaurus is the same as that of the Monitor, Iguana etc. and consequently I am convinced in separate alveoli [sic]. However there may exist of both kinds; as we have not yet made researches sufficiently exact to pronounce with certainty, and as such researches are both very difficult and require a thorough knowledge of the dentition of the whole Saurian tribe, on which Cuvier has made a travail considerable for his great Comparative Anatomy and which will be published in the 5 Vol. of his *Ossemens fossiles*. I need not tell you that the laws on analogy are strongly in favour of the supposition that the dentition of the Ichtyosaurus is the same as in the Monitors etc.

Although the researches of Cuvier on the Ichtyosaurus have been inconsiderable, we can easily, and I think with strong probability of certainty, pronounce on the position of the exterior nasal opening. These orifices are placed immediately before and a little on the inside of the orbit; we have here three specimens with those orifices very well marked. Now such openings can only be one of three things, either the Lacrymal canal, 2nd the infra orbitary foramen through which passes the infra orbitary nerve, 3rd or [sic] the opening of the nostrils. That the two openings situated before the Eyes of the Ichtyosaurus cannot be the openings of the Lacrymal canals, it is sufficient to say that in no reptile of the family of the Sauria is this canal placed outside the

orbit, nor indeed is it in any reptile, and at the present moment I do not recollect to have met with any animal in which the Lacrymal canal opened on the outside of the orbit with the exception of the genus Lemur of Lin. in which this conformation is extremely remarkable [*sic*]: no reptile, as I said before, presents it ['and' deleted] although the Crocodile as [deletion] well as many other Sauria have the greater part of the Lacrymal bone, in which the canal is pierced, placed outside the orbital cavity. 2nd ['that' deleted] no reptile possesses an infra orbital canal, with the exception of the genus Cameleon,⁴⁵ as far as I have been able to see. The Crocodiles, Monitors, Iguanas and Lizards, as well as the Tortoises and Serpents do not offer a trace of it, whereas all the Mammalia possess it more or less developed [*sic*], as well as the nerve which it contains, in proportion with the Sensibility of the face. Now it is pretty clear that animals such as Tortoises, Crocodiles and lizards could have no occasion for such a nerve, as their face is covered by a horny osseous envelope [*sic*] which is entirely insensible, in the same way as the nails in the fingers & toes of more sensible animals and like the hoof of cows and horses. We find even a proof of this among reptiles, for the Cameleons which have the face covered by a soft skin also possess infra orbital nerves: consequently it is not probable that the Ichtyosaurus, which resembles in other respects so much to the Monitors, Crocodiles and other Aquatic Sauria, should ['possess' deleted] present an organisation of the facial covering & of the nervous system of the form so different from these latter. 3rd that the two openings before the eyes of the Ichtyosaurus must be the nostrils, every circumstance concurs in favouring. Placed partly in the intermaxillary & limited posteriorly by the Superior part of the nasal bones (which differs from that of the monitors & Iguanas a little I must confess, because in these latter it is the inferior part of those bones which limit posteriorly the nasal openings). Indeed, to constitute the exterior opening of the nostrils it is by no means necessary that the nasal bones should enter into their composition, as the Gavial (*Crocodylus Gangeticus*),⁴⁶ has those apertures entirely formed in the intermaxillary bones, whereas the other Crocodiles have them formed laterally by the intermaxillary and superiorly by the nasal: it is a difference of comparity [*sic*] of very little consequence: finally all researches that we have hitherto made to discover the nasal openings at the extremity of the upper jaw have been unsuccessful, although we have two specimens in which those parts are perfectly preserved: and if such openings existed we must have, I think, discovered them, as we at the first did not doubt of their existence from analogy, and, although Sir Everard Home⁴⁷ has given a section of the head⁴⁸ where he thinks the nasal canals should be, I am sure nothing conclusive can be admitted from his plate and much less from his description! It is not probable that the Ichtyosaurus had the Sense of Smelling much developed, because it was essentially an aquatic Being: and that this sense was much inferior to that of the living Sauria. The Crocodile is the species in which this organ occupies the greatest extent; in the other reptiles it is much less developed and the olfactory nerve much smaller, the difference arising from the manner of procuring their food ['and of obtaining it' deleted]; but in the genera especially Aquatic, that is those which never quit the Aqueous element, the sense of smelling is entirely destroyed as in the Cetacea, or very little developed and serving rather towards respiration as in the Turtles (*Chelones Brongn.*); such as, I presume, the use of the nasal openings of the Ichtyosaurus.

The intermaxillary bones of the Ichtyosaurus form the greater part of the Alveolar process, that is contain the greater part of the teeth, at least two thirds of the ['outer' deleted] whole, and forms with the Molar bone the inferior part of the orbit.

I beg you to substitute intermaxillary in speaking of the nasal openings; those openings are placed almost entirely in the intermaxillary bones in the Ichtyosaurus, as I said, but limited superiorly by the nasal, so that now I have not the least doubt as to their identity in the Ichtyosaurus, as I have, I think, shown that the openings before the eyes cannot be the Lacrymal canals and their position in the intermaxillary bones proves beyond doubt that they cannot be the infra-orbital holes which are *always pierced in the Maxillary*.

Sir E. Home says in his last ridiculous paper on the Ichtyosaurus³⁹ that he has found the bones of the pelvis: I should like to see them, will he publish them?

As to Mr Conybeare's new Animal,⁴⁹ I will not pretend to judge, but the disposition of the Bones of the arm seem to put beyond a doubt that it is very different from the Ichtyosaurus. I cannot say any thing on the bones of the hand, as some of them are placed in a supposed position,

because I fear that naturally these oval bones, which resemble to those of the carpus of an animal, were not along side the longitudinal ones, which resemble more to the Phalanges of certain Cetacea and Tortoises & to the same animal as the round bones which formed its carpus. But relative to the Sternal Bones, or what Mr C.⁵⁰ calls his Clavicle and Scapula, I cannot adopt his opinion: in finding a resemblance with those of the Crocodile, my reasons are the following, but before giving you them I must say a word or two, as those bones in the different class of Sauria. All vertebrate animals have the anterior extremity connected with the trunk by means of a broad bone for the insertion of the suspensory or connecting muscles. This is the *Scapula*; its identity is easily discovered in the 3 first classes of the Vertebrates. In some animals this bone is connected with the trunk and its connexion strengthened thereby as [in] man, the Quadrumana and in fact all the animals which enjoy considerable facility of motion in the anterior extremity: whilst all those which do not possess clavicles, such as the Pachydermata, Ruminants and many Carnivores, enjoy a much less facility of motion. On quitting the Class of Mammalia and entering that of Birds, where the facility of movement [*sic*] must necessarily be increased, nature has given to those animals a double clavicular apparatus; this first consists in a forked bone which Mr C.⁵¹ calls the Clavicular furculair and whose use is to separate the two extremities to prevent their too near approach during flight; and is the real and analogous bone of the Clavicle of the Mammalia and consequently of Man. There is no doubt then that this furcular bone is the clavicle, since it gives (attaches) origin & insertion to the same muscles as that bone in Man. The second bone is what has hitherto been improperly called clavicle and which connects the true Scapula to the Sternum. It is in many species a distinct bone at all ages, and in every species separated [*sic*] during the early period of life from the Scapula. It is in the interval that separated [*sic*] the Scapula and clavicle that the Humerus is articulated or in other words that is placed the glenoidal cavity. It is not long since the true analogy of this bone was pointed out, and only by the comparative anatomy of the muscles which are inserted into & which arise from it: the muscles which arise from [it] correspond perfectly to those which arise from the Coracoid process in Man and the other Mammalia, and consequently this pretended Clavicle is nothing else than the Coracoid apophysis which is much more developed than in Mammalia, because ['the' deleted] its muscles are much more powerful. From Birds to the Saurians there is but one step, for on examining the Crocodile we find two bones of nearly equal size supporting the anterior extremities. The first and superior of those bones is the Scapula no doubt upon that head, but the second or pretended Clavicle is nothing else than the Coracoid apophysis of Birds more developed and hence obliged to [deletion] stand in place & fulfill the function of the furcular, clavicle and Coracoid apophysis. The muscles which arise from it and all its relative connections [*sic*] tend to confirm this fact, so that Mr Cuvier (Regn. Animal. 11. p. 19) observes correctly 'que les Crocodiles sont les seuls Sauriens qui manquent des os claviculaires, mais que leurs apophyses coracoids s'attachent au Sternum comme dans tous les autres Sauriens'. I have had occasion lately to confirm this opinion in the dissection of a small Crocodile which we have had here: The Clavicle of the Monitor Lizard *Ichtyosaurus* etc. is nothing more than that of the crocodile with the addition of the furcular bone of Birds and with the first bone of the Sternum considerably augmented in size, so that before the true Sternum are found the furcular, two large flat bones which correspond to the anterior bone of the Sternum of Mammalia (which is always larger than the following) and the two Coracoid apophyses, improperly called Clavicles. The same disposition more or less is to be found in the *Ornithorhynchus* and *Echidna*.

After this long and, for you, tedious and uninteresting (I fear) preamble, let us come to your fossil. From the sketch, I clearly see that the bone can only be the Coracoid apophysis; its form, its connexion with the Scapula, its forming with this bone the glenoidal cavity to receive the head of the Humerus, all concur in establishing the correctness of my opinion, so that if you have any influence with Mr Conybeare you would do well to suggest to him to correct the fault he is about to commit in calling it the Clavicle.

Those two bones alone are sufficient to prove that the *Plesiosaurus* belongs to the same division of Sauria as the Monitor, *Ichtyosaurus* &c. but to that subdivision or at least near to that family which contains the *Ichtyosaurus* ['which' deleted] or especially aquatic [*sic*]. The structure of the foot sketched by Mr Conybeare would seem to point out a species of passage from the Living

Lacerta with clavicles or furcular bones to the Ichtyosaurus and establish a kind of link between the Sauria actually existing and the inhabitants of former worlds. The name of Plesiosaurus is a very good name I think, perhaps a little too relative; would it not be better to give some other name which would express either some peculiar structure in the animal, or one relative to its high antiquity, while retaining the termination *Saurus* which I think has been very happily chosen, as that of *Therium* for the Quadrupeds (Mammalia).

I should be glad in yr. next letter, which I hope will be soon, to let me know if the oblong quadrangular bone, in the centre of which I have made a [illegible: possibly 'strand'], are surrounded on all sides by an articulating surface as in the Ichtyosaurus, or if that articulating surface was only at the superior or inferior extremity as in the metacarpal bones and phalanges of the Dolphin & Tortoise.

I can say nothing on the vertebrae.

On the whole I think Mr Conybeare will render to the fossil Zoology & comparative Anatomy a great service by publishing his present observations & continuing his [deletion] researches on those animals, and am sure that, although having fewer opportunities than Sir E. Home, he will, from that Philosophical spirit of research and investigation which he has shown in his Geological memoirs, render a much more essential service than that ['of' deleted] which have rendered the different abstruse, incomprehensible and for the most part uninteresting (except by the Plates) papers of the London Baronet,⁵² which, crowding the Transactions of the oldest Scientific Society of Europe,⁵³ have often prevented the publication of others much more interesting for the scientific world. and much more honorable to the Society from which they ['emanated' deleted] were worthy to have emanated [*sic*]. I shall be very happy to see Mr Conybeare's paper as soon as published and am extremely obliged to you for your kind offer to send it to me as soon as it appears.

Mr Conybeare's letter gives me a still higher opinion of its author than that which I had from what you told me of him. I wish he would come over to Paris ['before' deleted] after the publication of his paper, ['it' deleted] and to prepare himself for the subsequent ones which he intends to give on fossils; it would be of great service to him.

My Dear Sir, Excuse this long dissertation or rather list of Objections, but believe that they are frank and only calculated to prevent mistakes. Receive them as frankly as they are given and you will oblige

Ever Yrs. sincerely
J. B. Pentland

To Revd Wm Buckland
C.C.C. Oxford

III

Au Jardin du Roi,
20 Sbr. 1821

My Dear Mr Buckland

I have just received both yr. letters, the one on Saturday last and the other this morning. I am happy to find by the latter that yr. boxes are safely arrived in London; fortunately I had not made as yet any enquiries on the subject when yr. 2nd letter arrived.

Mr Cuvier desires me for the moment to thank you for the superb present you intend to make him, he will write to you very soon himself more fully on the subject. I am sure nothing can be more liberal on your part as [*sic*] such an offer, which ['will' deleted] at the same time that it will render Mr Cuvier under an obligation to you personally, will ['be' deleted] advance in his hands considerably the history of this interesting and extinct species: he is now working precisely at his article Rhinoceros for the new edition: he has suspended it in awaiting the arrival of yr. head.⁵⁴ You do not say if the lower jaw is with it. The absence of the teeth is of little consequence as there exists very little difference (and no Specific one) with the living Rhinoceros. You know that some Zoologo-Geologists advanced an opinion that the fossil Rhinoceros was the same as that from the Cape of Gd Hope. We have just received a fine skeleton of this latter, there is a very

considerable difference. Neither does the African Rhinoceros resemble that found in Italy. It appears therefore that there exists two species of fossil Rhinoceros, one with an elongated occipital ridge, a bony nasal septum and bicorn. [Deletion] It is most common, found in Siberia, England & Germany. The other more nearly allied to the Indian species by the general shape of the head and only found in Northern Italy.

Mr Cuvier is also much obliged to you for the trouble you have taken in getting the drawings of his Elephant's jaw at the Geological Society. Could you persuade Clift or Sir E. Home to let us have a rude sketch of the Malayan Tapir, but more especially of its bony head, & of one or two of its grinders. We expect soon one here, but *en attendant* our curiosity is great. In such an occasion, it would be curious, in my opinion almost impossible, that the Tapir of the Promontory of Malacca was the same as that of South America, the *habitat* of the larger species is in general [*'very' deleted*] circumscribed within very narrow limits.

Cuvier has nearly terminated his article on the fossil Crocodile and will immediately set too [*sic*] that of the Ichtyosaurus: his drawings are all finished and ere long we shall have a good description of this anomalous REPTILE. Your specimens will also arrive very à propos. I shall answer for their safe return. Will you send your Stonesfield reptile⁵⁵ or will you publish it yourself?

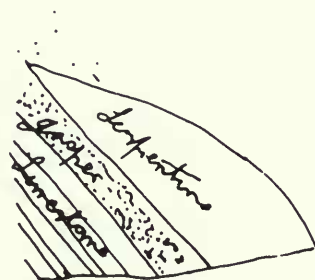
As you send so much, Mr Cuvier expects to make you some present in return: Let me know what you wd. like to have most of what can be Gained here.

We have just received one of the most numerous collections of Zoology & comparative anatomy that has ever arrived in Europe: it comes from the Cape of Good Hope. Among other most interesting objects there is a complete and perfect Skeleton of an immense Hippopotamus, a skeleton of Rhinoceros bicornis, and several others. The former is come very à propos for Cuvier's paper on the fossil Hippopotamus; for the present I can assure you that, after a hasty description which I myself have made and comparing it with the fossils of the Museum, I find that there exist differences very considerable (perhaps Specific), so that the fossil bones appear to belong, like those of the elephant & Rhinoceros, to extinct species.

Brongniart⁵⁶ proposes to write to Mr Stokes⁵⁷ on the subject of his trilobites. He, in conjunction with Desmarest,⁵⁸ is preparing a considerable work *ex professo* [*sic*] on fossil Crustacea or Crabs, in which he will describe all and figure the greater number of those actually known. Perhaps this will induce Mr Stokes to let Brongniart have his drawings for an object of such general utility. If you should see Mr Stokes before, pray speak to him on the subject.

Brongniart is also About to publish a paper on [*'the' deleted*] a superposition of a rock which he calls Serpentine but which appears intermediate in its nature between Variolite & Gabbro of Von Buch⁵⁹ or Euphotide. It lies on [*'a' deleted*] much reddened beds of jasper of flinty slate, which repose themselves on beds of limestone which is analogous to that of the Piedmontese

Alps of that of Genoa: this locality is not far from the town of Spezzia, State of Genoa.



What is your opinion on the Secondary gypsum? Do you believe that there exists more than one [*'between' deleted*] formation or deposition immediately under the Calcaire à Gryphites or Lias, the same as that of England, which contains Salt, and which is in a like position at Salins in the Jura, [*'always' deleted*]. This gypsum always calc. à gryphites or Lias is accompanied by

calc. & gypsumite
or lime
bedded
with gypsum
= salt
sandstone

Salt Springs, The marginal Section is found at Salins. The Sandstone is probably a member of the same formation as that containing salt.

I am glad Leach gets on so well. Write to me by next courier or, as soon as you can, let me know when you think you can send the Rhinoceros head, as Mr Cuvier desires me to ask you.

Mr Cuvier and family desire to be kindly remembered to you, as also does Dr Robertson,⁶⁰ Underwood,⁶¹ Brongniart and our good little friend Laurillard. Remember me kindly to Daubeny⁶² whose 2 or 3 parcels on Auvergne are enough to frighten any moderate Doubter and a sufficient warning against subscribing to Jameson's Journal.⁶³

Believe me ever yrs. most sincerely
J. B. Pentland

I enclose a letter for Mr Stokes. Pray send it to his address in London.

To the Revd Professor Buckland
Corpus Christi College
Oxford, England

IV

Paris 6 Novr, 1820
au Jardin du Roi

My dear Mr Buckland,

After all Schlotheim's⁶⁴ discovery of Human fossil Bones is nothing but an *Humbug*. He has just formally contradicted the assertion of his book⁶⁵ in Ocken's Journal the *Isis*,⁶⁶ he throws the entire blame on his bookseller who appears to have introduced it into his book to enhance ['and' deleted] its value, and consequently encrease [*sic*] the sale of the ['Book' deleted] work. It is a good way to throw of [*sic*] one's own shoulders the charge of ignoramus and Charlatanism which Schlotheim has shown in the *rigorous determinations osteological* of the different Cock's and Hen's bones which he supposed to belong to father Noah. I told you, the moment I heard of the circumstances, that I considered it improbable & am happy now to be able to confirm my prophesy. I have just perused Schlotheim's book, it appears to me to be a most incongruous and certainly useless composition. He gives upwards of 100 pages of fossil Mollusca, employs many new names without citing a single figure. I need to say nothing more to you on the merit of the work.

I have considered your observations on the Diluvian gravel which you were so good as to discuss with me. I am now almost entirely converted, and expect anxiously the publication of your paper on the Gravel Beds. The account which we have just received of the immense blocks which have been lately thrown up during the tempestuous weather on the coasts of France & England are strong proofs of the comparative effect of fresh water rivers and of the sea in the removal and deposition of those large Blocks, which which [*sic*] are so abundant in the diluvian gravel beds all over Europe: but in adopting your ideas on the diluvian gravel I am very far from supposing with you that the remains of Animals contained therein belong to individuals which formerly lived in the latitudes where they are actually found. The climate of our northern latitudes

must have materially changed to have allowed Rhinoceros & Hippopotamus, now limited to the torrid zone, to exist where their bones are actually found. Such a change of climate is inconsistent with the established laws of Meteorology & astronomy, and I cannot see, were it possible to introduce such an hypothesis, any service that it could be towards the explanation and full confirmation of the last diluvian '*Cataclysm*': On the contrary, if you suppose that the bones of those animals have been deposited where we find them or nearly so, by their former possessors, it will be a strong argument in favour of those who suppose that the last deluge, (that consequently which is recorded in the Mosaic History), was rather partial or restrained to certain countries, than general over the entire earth's surface. For a long time I was a warm advocate of this latter opinion, but I now begin to stagger, according as I advance in the study of the Zoology of the antient [*sic*] world, where I find the distribution of its genera & species universal as far as Geological investigations have yet been able to proove [*sic*]. It is now an established fact, that in all those countries where the study of fossils has been cultivated, from the Cordillera of Quito, Imbabura⁶⁷ & the Plains of Peru to the most northern parts of America, passing then into the old continent, we will find in every part of it [*that*' deleted] the remains of an Elephant very different from those actually existing and which does not offer the least difference from those which we possess (here) from Peru and Quito, I say who can suppose that this species was so universally distributed over the earth's surface as to have [*existed*' deleted] lived every where, where his remains are found. Is it probable that the Elephant of the Lena⁶⁸ could have inhabited Peru, or that of our temperate latitudes, the equatorial regions? Modern Zoology offers us no such a general distribution in any of its species, and it is highly improbable that the laws of Organic life were other in former times than they actually are. In my humble opinion it is much easier to suppose a general dispersion of the remains of [deletion] certain genera & species all over the globe's surface by the effects of the last and very recent diluvian action, than to call into our aid a deterioration in which certain climates [words missing] or an universal equality in the distribution of heat over [deletion] the globe in order to allow the same beings to exist from the Pole to the Equator. Either of those latter suppositions are, I may say, equally absurd, the laws of Necessity and Astronomy cannot admit them, and I am sure no Zoologist who is acquainted with the actual distribution of organic life over the surface of this Planet will attempt to call them to his assistance: I have adduced the Elephant for example, I might have equally taken the Mastodonte à dents étroites,⁶⁹ The Lion of Gaylenreuth⁷⁰ and the Hyaena⁷¹ certainly never lived in Franconia, although it be the opinion generally adopted that they died where their bones are found. Such an opinion were natural enough from the local accompanying circumstances, had they not been found elsewhere dispersed in the Diluvian gravel. They thus enter, for me at least, into the common category with the [*other*' deleted] remains of the other antediluvian animals properly speaking: it is not probable that, within so short a span of time as that which has elapsed since the last revolution of the globe, that [*sic*] nature has so far changed in her operations as to circumscribe within very narrow limits those animals whose remains are every where almost, might I say, found. Instead of endowing them with a constitution & a Structure which would allow them to inhabit, without detriment to themselves, every part of the globe's surface, as you are inclined to suppose, faculty which man and man alone now [deletion] a day [*sic*] enjoys amongst all living beings.

Brongniart is about to publish his paper on the Trilobites which he read five years ago at the Institute and which has hitherto remained unedited: He requested me to beg your assistance by sending him if possible [*an*' deleted] some Wax or plaster of Paris moulds of the most remarkable [*sic*] of your own collection or of those to which you may have easy access. I write by the present Courier to Mr Stokes on the same subject who you know possesses so fine a collection; would you second my demands, as I fear that they may appear highly unreasonable on my part from our slight acquaintance.

I had a long conversation yesterday with Beudant;⁷² he insists on making your formation of green Sand a subordinate part of the Chalk. Such for those who have seen the extent and make up of the green Sand [*will*' deleted] appears an absurdity—difference of composition, fossils &c. In my opinion passage from one formation to another, as in the present instance, cannot establish identity. Is granite or gneiss to be considered as the same formation as Mica-schist

because passage may be observed from one to the other?⁷³ That from Chalk to greensand is nearly the same thing: I think that the French do not really know what the green sand is, from what their writings & their conversation show us on the subject.

I shall expect to hear from you. How is Leach? Any new fossils discovered?

Believe me ever yours ever sincerely & devoted
Joseph B. Pentland

V

ADMINISTRATION DU MUSEUM D'HISTOIRE
NATURELLE, AU JARDIN DU ROI

23 Decr. 182[0]

My Dear Sir,

Your description of the Fezzan & Tripoli rocks is extremely interesting. I have seen Brongniart this morn[ing]: he is highly pleased with it, it is a further extension of the Tertiary strata, hitherto considered within so narrow limits. I expect you will let me know what Lieut Lyon's⁷⁴ Plain of Bones is; I hope it, when explained, will turn out as the Petrified men of the same country lately described or rather explained by Capt Smith.⁷⁵ Make all possible enquiries on the subject. I have communicated yr. letter this morn[ing] to Cuvier. He desires me to request from you an explanation on the Subject when you shall have had it from the author. I am almost certain that, if those bones really exist, that [*sic*] they belong to fossil species, as in a country so thickly inhabited by carnivorous animals, especially Lions and Hyaenas, it is not probable that the bones of their victims would be left entire, as those animals eat even those parts as far as our observation extends; it is probably a Second Depot like that of the Vale of Arno. I hope it may turn out as such; at the same time as it shall extend our knowledge on the inhabitants of a former world, will extend farther the distribution of fossil species; circumstance highly favorable to my ideas on the subject, which I detailed to you in a former letter.

The Verses⁷⁶ on your death has made every one laugh [*sic*]. Underwood has found them so good that he has requested a copy.

Have you any sections of the red marl on the Magnesium Limestone? Could you give me yr. opinion on the Secondary Gypsum?

I enclose a letter from Brongniart for Mr Stokes & one from myself on the Subject of the Trilobites: will you forward these.

Believe Me Ever
Yrs Very Sincerely
Joseph B. Pentland

au Jardin des Plantes

20 Decr. 1820

12 o'C. [12 o'clock?]

(forwarded to Revd Professor Buckland, Axminster, Devon)

VI

21 January 1821

Jardin du Roi

Paris

My Dear Sir,

I have just received yr. letter of the 10th inst. by the courier as well as that which you sent [*'by' deleted*] in Mr Cuvier's parcel; Mr Cuvier desires me to present you his thanks for the Book and Drawings which you were so good as to send him and intends writing to you himself one of those [*sic*] days, as soon as he can find a moment's leisure: in the mean time he desires me to say that he is under the greatest obligation for the Rhinoceros' head,⁵⁴ which he expects with impatience as he is just about to finish the article Rhinoceros for his new edition, the first volume of which will appear in May as the enclosed prospectus will inform you. It will contain the Introductory Memoir, the Ibis, the Elephant, Mastodon, Rhinoceros & Hippopotamus.

Mr Cuvier says he will be almost ashamed to accept your new & superb specimen of Ichtyosaurus; however he expects to make you some slight return, and we have already put by, or are about to do so, a collection of Montmartre Specimens. He will of course neither mention in his work and, if you require it, in the Gallery of fossils of the Museum when it shall be deposited that you are the donor. However, that will entirely depend on yourself. From your description I am almost certain that we have here nothing equal to the Specimen you intend sending.

With respect to the Drawings of the fossil teeth from the neighbourhood of Genoa, the one appears to belong to the Hyena and the other to a small and distinct species of Hippopotamus which Mr Cuvier calls the Petit Hippopotamus. However, from the drawing it is extremely difficult to pronounce positively as to this latter from the manner in which they were taken. [~~Did you~~] In such drawings it is much preferable to have them made of the crown of the tooth, or the grinding portion, than a lateral one as unfortunately you have made. However, by having a slight etching made of the grinding portion you would facilitate much its determination. One thing we can almost positively assert is that it belongs to *Palaeotherium* or *Anoplotherium*, as you will be able to convince yourself more fully when you shall have characterised [*sic*] specimens and well determined under yr. eyes. I have not yet been able to see Brongniart to ask him about the formation near Genoa, but will as soon as possible, and will write to you soon on the subject.

I have not heard from Clift [*sic*]⁴⁴ for some time. I should be glad to hear something of the collection sent by Sir Stamford Raffles and which he legally Stole in my opinion from Mr Duvaucel.³⁴⁻³⁶ However they have retained duplicates of the greater part of the objects sent to London, which are to be transmitted to France as soon as the arrival of the collection in London shall have been known in Calcutta. Mr Duvaucel is at present in the Dutch possessions in Sumatra at Palembang: our government or at least the India Company has lost a valuable person, I fear by the Caprice or perhaps the Jealousy of Sir St. Raffles.

You would much oblige me when in London to ask to see the Skeleton [*sic*] of the Malacca Tapir; does it materially differ from the American species by its head & its teeth, and in what are the differences, if the[y] exist, the most remarkable [*sic*]. I shall write to Clift on the subject but fear that he might feel unwilling to answer these questions as [~~deletion~~] Sir Everard Home has, I presume, a paper on the Stocks (such as it is) on the subject.

Brongniart I believe does not intend to publish a book *ad hoc* on the Geology of Italy, and only separate and detached memoirs on the Subject in the different Scientific journals & especially the Journal des Mines. He has already read a paper at the Institute on the *gisement des Serpentes* in the Piedmontese territory; he has found them lying upon beds of Limestone which appears analogous with the oldest Derbyshire. This limestone contains beds of a red ribboned [*sic*] Jasper which forms immediately under the Serpentine a bed of itself of considerable thickness.

Brongniart has not yet heard from Mr Stokes.

I am sorry to hear that poor Leach is not better or at least that you are not pleased with the last news you have had of him. We have had a report that he was replaced at the British Museum by a Mr Stevens.⁷⁷ This I cannot believe as I am sure that the Trustees would not be guilty of such an injustice, and as we have never heard of Mr Stevens' reputation as a Zoologist, I beg you to let me hear from you on this head.

Humboldt⁷⁸ is about to publish a new volume of the Travels in South America;⁷⁹ we hear nothing as yet of his geological labours.

Beudant's⁷² book⁸⁰ is in a considerable state of forwardness.

Mr Cuvier has already written to Mr Lambert⁸¹ at Calais to receive and Transmit to him by the Diligence your Rhinoceros & Ichtyosaurus's Heads⁸² on their arrival. I would recommend you send them by land to Dover, as some weeks might pass in case of yr. sending them to Calais direct by water from London.

Mr Cuvier & family desire to be remembered to you.
Believe Me ever Yrs. Very Sincerely,
J. B. Pentland

[POSTSCRIPT] I have just seen Brongniart. He presumes that the teeth came from a place called

Cardi Bona near Savona, not far from Genoa, as that of the Museum of Genoa was found there; if so he supposes that the formation of Lignite is of the same age as the Subappenine Hills, and thinks that the formation of Savona, Cardi Bona, St Remo &, to the SE of Genoa, Castile Nuovo are in the same formation, as respects the central chain of the Appennines on the South, as Castle Arquato, Piacenza & its environs are on the north of the Chain. He is also of your opinion that the formation is of the same age as that in which Escher⁸³ found his Castor's head. As soon as his paper on the Serpentine will be published, he will [deletion] read another on the modern formations of Italy. He wishes that you would give your ideas on the same subject, in some of yr. Scientific journals or Transactions.

Could you not lend Mr Cuvier the teeth of which you sent drawings. He will return them with the Mt Martre Bones which he intends sending you. Let us know the day your Rhinoceros & Ichtyosaurus head will leave London, so that some person may receive it at the Diligence. Beudant's Book will be in 3 v. [volumes] in 4to with an Atlas price 70 francs. Brongniart and Brochant⁸⁴ send their respects to you. J.B.P.

To the Revd Professor Buckland
C.C. College
Oxford, England
Care of *H. Heuland*⁸⁵ Esq

VII The next letter is from the collection of Dr & Mrs V. A. Eyles.

Jardin du Roi
21 Feb^y 1821

My Dear Mr Buckland,

I received your letter of the 16 Inst announcing the departure of the Rhinoceros's head and the Bones of the Ichtyosaurus, which I immediately communicated to M Cuvier; he requests me '*de vous faire de sa part ses remercimens [sic] & de vous demander mille pardons pour n'avoir pas encore repondre à votre lettre obligeant*', but as soon as he shall have a moment's leisure he shall write to you. He is now busily employed in getting ready his annual rapport [*sic*] for the Publick meeting of the Institut (which will take place in March) and which I will send you when published. He is also busy at Sir Joseph Banks's⁸⁶ Eloge⁸⁷ for which I fear he has not sufficient materials. His first Volume of the Ossemens fossiles is finished, and is already part printed & many of the Plates already engraved. It will contain the Preliminary discourse much augmented. I have already read a considerable portion of it. It seems to me to establish in the strongest manner the fact of a general deluge, the Epoch of which cannot be farther back than 5000 years. He discusses the traditions and historical documents of the different people of antiquity, as also those of the moderns, especially the people of the East as the Hindus the Burmans &c, & arrives at the same conclusion.

The first Volume will contain besides the Preliminary discourse the Chapters on the Rhinoceros, Elephant, Mastodon & Hippopotamus.

You say Sir Everard H. intends publishing a description of the Indian Tapir and Sumatran Rhinoceros. I hope it will be better than his papers on the Ichtyosaurus. However he has [*sic*] better make haste as we expect daily those two objects from India with many others which compose a very large envoi from Sumatra; if they arrive in time the description of the Rhinoceros will be incorporated into the body of the first Volume, if not it will be published in a supplement. To give you some Idea of the additions to his Second edition of the Ossemens fossiles it will suffice to say that it will contain the Osteological descriptions of many living species hitherto undescribed, namely the Sumatra & African Rhinoceros, the Hippopotamus, the Malayan Tapir, many new species of Carnivorous Animals, the Orycteropus, Tamandua & Tamanoir species of the Ant Eater family, besides that of the Dugong and of some new species of Dolphins. Add to those 3 or 4 entirely new fossil Genera of the order of the Pachydermata.

Brongniart is hard at work; he will soon publish his memoir on Monte-Bolca, the outline of

which I shall give you in my next. He is inclined, he tells me, not to adopt your opinion that the Nummulites belong exclusively to formations of the same [~~'epoch'~~] as those of Paris: as to y^r. other opinions he agrees perfectly. He is about to publish his work on the Trilobites which will soon appear; he requests me to beg of you to favour him with a notice, however short, on the Disposition and relative age of the Dudley-limestone. You will thereby render him a great Service, neither Brongniart or myself has heard as yet from Mr Stokes or do I suppose [~~'will'~~] shall we.

I am very happy to have so good an account from Leach, I have just received a letter from himself which is [~~deletion~~] evidently written by a person in a rather disturbed state of mind.

I intend going in the beginning of April to visit the NW coast of France, where the whole succession of Secondary Strata may be seen, in an extent of about 30 leagues, from the red sandstone to the Upper Chalk; the Sections are good all the way. In your next letter would you let me have a section of the Southern Coast of England from Dover (where Phillips⁸⁸ has left it) to the Primitive Strata. Does the red Sandstone ever appear on y^r Southern coast?

Adieu My Dr Sir

Believe Me Ever Yrs very Sincerely

J. B. Pentland

[On back of letter, around address]

If you see Mr Stokes, will you speak to him about the Trilobites. I think you would much oblige Cuvier much [*sic*] by offering to give him a short notice on the Lias formation & others which contain the Ichtyosaurus & other reptiles.

Have you yet proposed Cordier at the Geological Society, ? or do you intend to do it?⁸⁹

Write to me as soon as you can about the Dudley Limestone.

The lithography [~~deletion~~] machine is worth very little I fear; that of Cuvier does not succeed as well as one could wish.

Revd Professor Buckland

Corpus Christi College

Oxford, England

W. S. McLeay⁹⁰

Postmark 'Fe 26 1821'

VIII [The next letter is undated, but internal evidence shows that it was written between 21 February and 7 May 1821:]

My Dear Mr Buckland,

Messrs Cuvier & Brongniart desire me to request to you to send them Mr Mantell's Work on the South Downs⁹¹ (of which you sent [~~'Me'~~] me a Prospectus some time ago) with the least possible delay, as they want it for the second edition of the Geology of the environs of Paris. which should appear in August.—The best way wd. be to direct your London Bookseller to send it addressed to Mr Cuvier by the Mail—or by Mr MacLeay—the price I shall remit you either in Books or money. The former I presume you will prefer. [~~Deletion~~]. Mr Conybeare has commissioned me to send him Cuvier's first volume which will pay a part of the [£]3 . . . 3 which Mantell's Work I believe will cost: you will specify any other Books you may want. I shall send them punctually.

I wrote to you enclosing the Second part of my reply to Mr Conybeare last Thursday, which I hope is come to hand ere this.

I have never yet been able to get Humboldt's answer to yr. Alpine paper which he promised me.

We expect [~~'daily'~~] a very large collection of objects of Natural History this week, consisting of 14 cases of quadruped, birds, fish &c. from Sumatra, Malacca—Java & the Peninsula of Hindostan, collected by Madame Cuvier's son during his unfortunate excursion with Sir Stamford Raffles.

Hauy's⁹² new Treatise on Natural Philosophy is just published in 2 octavo vols. His Mineralogy or Cristallography [*sic*] will soon follow.

Cuvier & family desire their best respect to you.

Believe Me Ever.

Yours sincerely,

J. B. Pentland

Have the Book addressed as follows:

Baron George Cuvier,
Conseiller d'Etat,
Secrétaire Perpetuel de l'Institut
au Jardin du Roi, Paris

Revd Professor Buckland F.R.S./Corpus College/Oxford/England

IX

Jardin du Roi

My Dear Sir,

I received yr. letter & casts of the teeth from near Genoa, and have handed them over to Mr. Cuvier. They belong to a new genus probably intermediate between the Anoplotherium and the small Hippopotamus, but of this more hereafter.

Will you let Mr Cuvier have a pencil drawing made of your fossil Rhinoceros bones from Warwickshire,⁵⁴ especially the Humerus & Os innominatum which you have so perfect, and as Cuvier has no such bones in his new work. He requests you not to take any trouble in having them finished, but merely pencil drawings on a scale of a quarter of the natural size or larger if you choose. If in yr. other Rhinoceros bones from the same locality perhaps you will have portions of the other large bones, either Scapula or bones of the extremity, which might be worth having drawn also [*sic*]. The only thing I must beg of you is to have them done & sent as soon as possible, as his paper on the Rhinoceros will be sent to the press in a few days, the introductory discourse and 300 pages of the text being already printed off. He will keep back the printing until hearing from you.

I send you the prospectus you desired. I hope you have received my two last letters with Brongniart's sections of Italy; tell me what you think of them. I will send you Brongniart's paper on the Serpentes with the Almanack of the Institute, perhaps this day week. B.[rongniart] has promised me two or three of those papers, would you like to have one for some of yr. friends? I will give one to Mr Conybeare.

We have not here the head of the *Bos moschatus*, but wd. change that of any other animal. Wd. yr. museum change one for a cast of our Palaeotherium head?

Mr Beaunier⁹³ is returned to Paris highly charmed with England, and very grateful for the attention paid him, he considers himself much indebted to you.

Adieu & Believe Me (in haste)

Yrs. Very sincerely,

J. B. Pentland

24 April [1821]

Monday 2 o'clock.

Revd Wm Buckland
Corpus College, Oxford

[Postscript on outside] Could you get a small quantity of the Naphthaline of Dr Kidd?⁹⁴ It is very curious, and unknown here before Mr Beaunier's return.

X

Jardin du Roi, Paris, 7 May 1821

My Dear Mr Buckland,

I have been prevented from writing you by the two last courriers on account of the Easter



Alexandre Brongniart. (Reproduced by courtesy of Expansion Scientifique Française, Paris and M. Paul Ardouin).

holidays and lately by the fetes of the Baptism of the Duke of Bordeaux. I am sorry that I am now able to write you a few lines [*sic*] being very busily occupied in making out the Catalogue of our East Indian collection, which is lately arrived. I am charged with the Classes of Reptiles & fishes. We have received the Malayan Tapir which is very different from the American though indubitably of the same genus, as also an [deletion] entirely unknown and new species of Rhinoceros from Java, very different from that of Sumatra. When I shall have finished by catalogue I shall write a long letter to you.

I enclose a copy of Brongniart's paper on the Serpentine, one for you & one for Mr Conybeare, which you will have the goodness to present with Brongniart's compts. [compliments]. I send you also a copy of the plate of the Coal formation of St. Etienne: which shows the deposition of the Vertical trunks in the sandstone and that of the clay Ironstone which they only now begin

to turn to a profitable account in France. I shall send you Brongniart's memoir there upon as soon as published.

Cuvier's first volume will not appear this month. The length of the Discours préliminaire will not allow the paper on Rhinoceros to enter into this volume: so that you will only have the Elephant, Mastodont & Hippopotamus. The second will contain Rhinoceros (very long), Tapir with the osteology of the Malacca species, and Palaeotherium, the third the Anoplotherium & geology of Paris. We are now busy at the Palaeotherium & Anoplotherium; there will be two new species of the former and perhaps two of the latter, from the environs of Paris, besides several others from different parts of France &c.

The cast of Palaeotherium's head is ready. We do not know whether to send it immediately or to wait until 22 other casts which we destined for you to be ready. The head *is extra magnificent*, write to me if you wish it directly, if so I shall send it !!!

Believe Ever Yrs. Sincerely
In Haste,
J. B. Pentland

Revd Wm. Buckland F.R.S.
Corpus College,
Oxford, England

XI

(Pencil date '28 May 1821'

My Dear Sir,

[First paragraph, lightly crossed out, reads: I wrote to you last Thursday by the French Ambassador's Courier, in which I answered yr. last letter ['of the' heavily crossed out] but fearing that some delay may occur in the reception of my letter, I think it more sure to write a second time.]

Cuvier desires me to say that he will be highly gratified by the drawings of the bones of Rhinoceros, whatever those bones may be. =either Vertebrae or long [b]ones. For the manner and position in which those drawings should be made, I only refer you to Cuvier's plates of living Rhinoceros, only on a much larger scale if possible, the long bones at least 1/3 or 1/2 of natural size. They will be published in the beginning of his second volume, when Cuvier will have another opportunity of speaking of Miss Morland's talents and of your liberality and zeal: as to the Bos Moschatus Mr C. is much obliged to you for requesting Capt Parry⁹⁵ to get him the head. I wd. be glad that you wd. send the drawings of the Rhinoceros bones as soon as you can, as all the plates for that memoir are already engraved. I think I will be able to send you the engraving of the Rhinoceros head which you gave us by next courier.

Underwood⁶¹ & Robertson⁶⁰ are just returned from their Geological trip in Auvergne. Underwood desires me to ask you if, in the middle of July, you will be still in Oxford: he goes to England in a few days.

I enclose you a letter which please to send to London by post, if you have not an immediate opportunity.

Mr Cuvier desires to be kindly remembered to you, as also does [*sic*] Robertson and Underwood.

Believe Ever,
yrs. most sincerely
J. B. Pentland

Jardin du Roi
28 May 1821

N.B. This letter which I say I enclose has been since sent by another person.

Revd. Wm. Buckland F.R.S.
Corpus College/Oxford

Postmark
May 31 1821

My Dear Mr Buckland,

I received yr. letter of the 12th inst. with the memoirs on the geology of the Alps,⁹⁶ a part of which I have already distributed. I am much obliged to you for the one destined for me. I am sure both Humboldt & Brongniart will be highly pleased with it, especially with the comparative tabular view placed at the end [‘of it’ deleted]. As soon as I shall have learned more positively their opinion on the subject I will write to you. Cuvier has been so busy lately that he has had scarcely a moment’s time to read anything: the discussion of the Budget in the House of Deputies has taken up all his time for the last 3 weeks. He has however perused yr. paper on the Diluvian action, and of course thinks highly of it, at the same time as it enters perfectly into his views on Diluvian action. He is only sorry that it arrived too late to be cited in his Discours Préliminaire, the Geological part of which has been printed off more than a month back.

I showed him yr. letter where you speak of the different bones of Rhinoceros which Miss Morland⁹⁷ is about to draw: he desires me to present you his best Thanks for the interest you take in forwarding so many new materials for his work, which he says will owe more of its utility to you & Miss Morland’s talent than to any other of his friends. I presume I shall receive the drawings by Monday next. Be sure to have the extremities of the Long bones drawn: and a birds eye view of the Condyle of the lower jaw, and above all accurate measurements of the different dimensions.

I am extremely glad to hear that Leach is so far recovered as to be able to return to the Museum. If you should have any news of him between this and yr. next letter be so good as to mention it, as everyone here (Cuvier’s family) are extremely interested about him.

I have at last made up my mind to leave Paris for England. I think I shall be in London towards the end of July, in hope of getting out to India shortly after or as soon as possible. You know that my mind has been always tending towards that part of the world, for two reasons. The first, that so very little opening exists today in Europe for a person of my age except endowed with very superior talents & acquirements; the second, that my exertions can be of little use to a country which possesses so many first rate men in every branch of Science as Great Britain. You were so good, during your stay in Paris last Autumn, as to say you would render me any service in your power in forwarding my views, and as you have perhaps as much influence as most Scientific Men in England with the Government I am sure you could render me many services.

My intention was to go out to India as a Medical man, but since I have applied myself so closely to science, and above all since I have seen so much of that little jealousy which is so common in the Profession, I have taken such a disgust to every thing in the shape of Physic that I am sure I never will be able to make my way as a Physician: this is the reason why I do not wish to go out to India in a medical situation, for I have no Idea of taking on myself so important a charge, without being able to fulfill my engagement towards my employer: if I cannot get out to India in some other situation [deletion] in more harmony with my feelings I would much rather remain in Europe. Not in England, as I fear there is there [*sic*] but little chance of succeeding, and I have received more than one proposition from the Russian government to enter into its service, I fear that in case of failing in my attempt to establish myself in India I shall be for ever obliged to expatriate myself from all that is dear to me.

India has long fixed my regards, as a country where there is a great deal to be done in every branch of Natural History. That I am adequate to such a task you will best judge from the opportunities which I have had for the last three years, of having access to all the Museums of Paris, and of following the numerous lectures which are daily delivered on every branch of science in the French Capital.

I began in France by studying Mineralogy and Chemistry, in the first of which I received the greatest assistance from Haüy,⁹² who pushed his complaisance so far as to allow [‘me’ omitted] to visit specimen by specimen his own private collection as well as that of the Garden of Plants, and gave me even private lessons in Cristallography [*sic*], which he said I knew as well as any of his pupils. I have certificates of such. As to Chemistry, Mr Gay Lussac⁹⁸ allowed me to follow his lectures at the Ecole Polytechnique as well as the other courses delivered at the celebrated

establishment, permission which no other Englishman has before or since enjoyed with the exception of the unfortunate Riche⁹⁹ who died in Africa. I at the same time worked for 12 months in the chemical laboratory of Mr Thénard:¹⁰⁰ I then began Geology ['who' deleted] in which I was powerfully assisted by Messrs Brongniart, Brochant,⁸⁴ & Cordier,¹⁰¹ the two first of whom allowed me a free access to their collections, and to that of the Ecole des Mines. It was after receiving from them the Elements of that Science, that by their advice I undertook my voyage into the South of France, in which I visited the Dordogne, Berry, Limousin, Périgord, Auvergne, Cantal, Vivarais, Sily [?], a part of Languedoc, Lyonnais, that part of the Alps in the neighbourhood of Geneva and Burgundy on my return. I thus spent 17 weeks during which time I travelled near 2500 English miles, and all on foot. I may say that it was then that I received for the first time a decided taste for Geology. Since that period (1818) I have been constantly occupied with the same studies, but from the moment that I traversed the Jura that I saw the quantity of fossil remains which it contained, I immediately conceived the utility of the study of ['the' deleted] Zoology, study which very few Geologists had yet taken up. It was then, that becoming acquainted with Cuvier more immediately than I had hitherto been, this great man allowed me to ['study' deleted] avail myself to his labours, by opening to me his collections and by allowing me to work in his own Private Laboratory. He has even pushed his complaisance still farther by permitting me to make use of his own rich Library, to consult his portfolios of notes & drawings, and he has even charged me at several times with the arrangement of his collections, which is confided to another young man & myself. It is not only in encouraging my study and in forwarding my scientific views that I have to thank Cuvier: he has gone still further, I am received into his family as a relation and an initiate, and you know yourself from the manner you have seen me treated by all the family what opinion they have of my conduct & acquirements.

Those are the principal recommendations I have to offer, towards being employed in India, in a Situation such as to be able to render services to Science, in a country where hitherto nothing has been done in Geology and where very few ['little' deleted] of the Animals which inhabit that vast Peninsula are known farther than the coasts. It is easy to conceive why Geology is so far in the background in India, because to be able to geologize, if I may use the expression, a knowledge of that of Europe is necessary and very few persons have more than a mere smattering of that Science. Geology does not consist in the collecting of hand specimens. Its great object is Superposition, object which is now arriving rapidly to something constant and invariable and to which no person has more contributed than yourself. I have been able then to consult & to profit of what has been hitherto done: I have seen also for myself, and have visited with care one of the countries, which offers ['the key' deleted] a kind of key towards the explanation of the causes which produced one of the most important class of Rocks (Volcanic) although not ['and' deleted] one of the most general.

As to Zoology, I will only mention two examples to show how far that Science is cultivated in India, the discovery of the Malayan Tapir which had been a long time in Lord Moira's¹⁰² Park at Calcutta by Mr Cuvier's stepson,³⁴⁻³⁶ who was then no zoologist, and since that time the discoverer of an entirely unknown and new species of Rhinoceros. In Ichthyology those great rivers the Jumna & Ganges on one side & the Indus on the other present a large field for enquiry, and you know that in Ornithology, from the little already known, the number of objects is immense.

Messrs Diard and Duvaucel³⁴⁻³⁶ have discovered in the single Island of Sumatra alone 7 species of Apes, 2 species of Deer, and of Antelope, & innumerable [*sic*] species of Birds and fishes.

To conclude allow me to repeat my request of yr. assistance in my undertaking. Be assured that the advancement of science (which is our favourite pursuit) is the only motive I have in view, & that if [I] shall succeed, I am sure you will have no reason to complain of my labours, & of the interest you shall have taken in forwarding them.

Adieu Believe with most [word incomplete]
regards,
Yrs ever sincerely,
Jos. B. Pentland

To the Rev. Wm. Buckland
Corpus College,
Oxford, England

(Bears seal of 'Fr. Academie Royale des Sciences')

XIII

Paris Jardin du Roi 2 July 1821

My Dear Mr Buckland,

I received your letter of the [gap] ult. last Monday, with the drawings of the Rhinoceros bones¹⁰³ for Mr Cuvier, with which he is hugely pleased ['and' deleted]. They seem done with much care and a great exact shape: I am desired by Mr C.¹⁰⁴ to present his thanks to you and to Miss Morland for those drawings. There is only one specimen which remains undecided, it is the pl. 6 of a vertebra viewed in 2 positions and which appears to be the Axis of a Rhinoceros. However the odontoid process or articular faces are too imperfectly marked in yr. drawing to warrant a positive determination. Mr Cuvier will get Miss Morland the number of copies she may choose of the drawings: and between ourselves I believe he intends to send her a copy of his work.

I enclose at last a part of my reply to Mr Conybeare. The ideas contained there are in for the most part my own, and have requested Mr C.¹⁰⁵ not to speak of any communication in his papers, at least not to cite my name, for very particular reasons.¹⁰⁶ You will be so good as to request him to do so yourself. I could have written a letter triple the length on the subject, but feared lest aridity of the details into which I must enter would render my description tedious and incomprehensible without drawings. You will see that, from the Osteology of the head, I have arrived so far as to establish the resemblance between the Ichtyosaurus & Lizard tribe, and have thus been obliged to constantly combat Mr C.'s¹⁰⁵ reasoning throughout, which I think I have done fairly, and hope that he will consider the details and reasonings I have been obliged to enter into, as [deletion] arising from no personal opinion of my own but from that love of truth which should actuate every person who wishes to treat of such matters. The principal object of the enclosed letter is to show that the Ichtyosaurus is a Saurian much nearer allied to Monitor & Iguana & Lizards than to the Crocodile, in proof of which the organs of sense and general confirmation, ['and' deleted] speak in favour of. I have only spoken once or twice of Sir E. Home's ideas, which I then shew are ridiculous, as coming from a man placed in the centre of Science and at the head of such a superb Anatomical establishment as the Hunterian Museum:¹⁰⁶ in my next letter (which will be in a week) I shall show that the opinions of Sir E. Home, who at one time wished to make a fish and at another an Ornithorynchus & at another a Proteus of the Ichtyosaurus were as unfounded as ridiculous, that those who wished to make a Dolphin of it did not understand the simplest laws of animal organisation, ['Had' deleted] and that Mr Conybeare in wishing to transform ['it' deleted] into a Crocodile the Ichtyosaurus (which resembles more to the other Saurii) did it from a total ignorance of the Osteology of the monitors, which he had no opportunity of studying. You will besides see by my letter that the first & all essential organs of the animal are constructed on the same model as in animals actually existing, but that the secondary points of organisation are *sui generis*, and authorise the establishment of a new family of Saurii ('in' deleted) which the Ichtyosaurus should form the type of.

I have left my letter open so that you may peruse it if you think it worthy of yr. attention.

I have distributed your Alpine paper, as you desired. Humboldt has promised to give me some notes on the subject which I shall send to you. He still holds out for his old opinion on Bunter Sandstone: he is not of yr. opinion as to Pappenheim, whereas Brongniart is, and as to the Diableretz he still wishes to make it an Alpen-Kalk: I shall send you also an account of what Brongniart will say on the subject. I have not been able to see him for some time: but am to dine at Leons [?] with him in a few days. He will *read today* at the Institut his paper on the *Series tertiaires* of the N. of Italy and especially on the Valley of Ronca & of Mount Bolca. He will publish this paper with plates of the shells of Ronca, which I shall send to you and Mr Conybeare, as soon as it shall appear. Have you seen Greenough²⁵ since his return? and do you think he has

much profited by his Italian trip in getting rid of his scepticism: he made very little impression on the people here during his short stay.

Cuvier's first volume is ready to appear. The printing of the title page is finished, so that in 10 days or a fortnight you may expect to have it in England.

I have read attentively your Lickey Hill paper¹⁰⁸ and am ['almost' deleted] entirely of yr. opinion, as I am sure is Cuvier, but you know that he never gives his opinion on any subject except in Print, and for your sake I am sorry that your paper arrived after that part of his work where he could speak of it was printed off.

I expect daily Mr Conybeare's drawings of Ichtyosaurus, especially those of the Palate & Pelvis, and of the ribs in position. Although we have here all the parts except the Pelvis, the moment is not arrived when they can be laid bare, Mr Laurillard (Cuvier's assistant) & myself being occupied with the Tapir, Rhinoceros & Paris fossils at the moment. The casts of the Paris fossils for your use are now painting. You will be delighted with them. They shall be sent the moment they are finished.

Mr Cuvier & family desire to be kindly remembered to you: how is Leach? I will not go to England before the middle of August.

Believe Ever,
Yrs. very sincerely,
J. B. Pentland

Jardin du Roi chez
le Baron Cuvier

[Postscript written around address] You will explain to Mr Conybeare the haste in which my letter was written, so as to bear some kind of excuse for my style which I only wish to [be] plain and easily understood: [deletion] I will expect to hear from you by return of Courier, as also from Mr Conybeare.

I would have recopied my letter so as to render it more lisible, but I am now so busy that this was impossible.

J. B. Pentland

To the Revd Professor Buckland F.R.S.
Corpus College
Oxford, England

XIV
My Dear Mr Buckland,

Pencil date '3 July 1821'

I am extremely obliged to you for sending the specimens of Ichtyosaurus with Mr Conybeare's paper,¹⁰⁹ both of which have arrived safe. Your polished specimens of the teeth are most interesting and prove [*sic*] beyond a doubt that my opinion was correct in holding out that the dentition was different from that of living Crocodiles, and approaching nearer to that of Lacerta however as I suspected and which I mention in my letter to Mr Conybeare. The dentition is also different ['also' deleted] from that of those latter in so much as the tooth never was intimately united to the bottom of the alveolas by a horny medium, at least so far as I am enabled to judge by all the specimens I have seen, for if you remark the inferior part of the tooth is separated on all sides from the bone in which it is implanted by a layer of calcareous spar, sometimes extremely thin. What Mr C.¹¹⁰ took for a new tooth within the old one is nothing else than the commencement of the ossification of the pulp, which fills up the bottom of the tooth. The middle part remains hollow as in fishes & Dolphins & in the larger species of the Lacerta family, for a considerable period after the ossification of the pulp below and in some at every period of life, and if you examine with care this new tooth, as Mr C.¹¹⁰ supposed it you will find it is continuous (in yr. specimen) with the external edge, by a very narrow & uninterrupted line of bony matter

which on one side (of yr. specimen is dislocated) [*sic*] but perfectly preserved on the other: besides the new tooth is entirely composed of a porous bony structure, without the least possible trace of a covering of enamel, which [?] should be the case was it in reality a young tooth: the proof of which is that in the same specimen there is the superior extremity of a really new tooth formed and which, although much smaller than that which Mr C.¹¹⁰ supposes to be such, has its enamel formed, and its entire substance of a much more solid and compact material than in the bony pulp of the others. It will suffice to observe those two and you will with a little attention see that they are of quite a different nature, and if the one be admitted to be a young tooth (which no person can doubt) the other certainly cannot. Besides to admit two so very different modes of dentition in an animal, even in the same individual, would be absurd and contrary to every basis of coexistence—& of analogy. Your specimens ['which' deleted] with which you & Mr. C.¹¹⁰ supposed to confound me, have as you see been the means of confirming my opinion, opinion which I had formed in the beginning, I will now confess to you after the analogy of the head, but which the researches I made previous to writing to Mr Conybeare still confirmed and which finally your specimens place beyond a doubt. There remains then but one difference between the *Lacerta* & *Ichthyosaurus*, namely that the teeth were never intimately united by a bony medium to the jaw bone, but retained most probably in the long maxillary furrow by the ligamentary matter of the gums, as in Dolphins, supposition which their dislocated nature in the greatest number of specimens renders still more likely.

As to your question if the *Ichthyosaurus* ever came on shore, I must say he never did as far as we can judge by analogy. Those analogies are founded on his resemblances as to the principal locomotion organs with the *Cetacea*, which once ashore can not get back to the water, but die on the sand for want of food: the presence of nails on the extremity is not any reason for his not being able to gain the land, because the eared seals (*Phoca jubata*¹¹¹ & *ursina*¹¹²) with very small nails, which they certainly cannot employ because of their being placed on the middle of the superior surface of the feet and consequently can never touch the ground as in common seals. However these animals come basking on shore, during the greater part of their lives. As to his breaking his back, this is not possible because of the great elasticity of the intervertebral substance, allowing much greater motion than in land animals. Besides you know than [*sic*: pres. 'that'] fish, when brought out of the water, never are subject to such an accident, although they execute much more violent movements [*sic*] when dying than the *Ichthyosaurus* could when simply driven ashore.

On the whole Mr Conybeare has published an excellent paper, as much superior to those of Sir E. Home as one thing can be to another. His manner of treating his subject has really astonished me, when I consider the opportunity of studying the living species which he had in his power. I wrote a long letter by the present courier, in which I discuss or rather, critique [*sic*] his paper in the order he has adopted.

Since writing the above, I have received a letter from my friends in London saying that my situation of Medical man in India can no longer be kept vacant for me and that I must go off immediately for London, which I intend doing in the course of the ensuing week. I must remain 2 months in London previous to my embarkation. I therefore beg of you to send me any letters you can for people who may be of service to me in London, especially one for Ld. Bathurst,¹¹³ as that which you gave me is now of an old date. I shall do everything in my power to go to Bengal, where there exists to openest field for research, I shall still hope you will employ your influence to have my appointment changed to that of civil officer. Although the place of Assistant Surgeon in a pecuniary point of view is very nearly the same as that of Writer (which I would like to get), still you can well imagine that this latter situation, at the same time as it is more consonant with my natural feelings, would place me in a much more favourable position to cultivate my scientific views, which is [*sic*] my principal and I may say only object. I could live at home by my professional talents, but then would have no field for any scientific pursuits, whereas in India, although not rich, I will be able to render services to the cause of Science: this is the only motive I have in wishing to go to Bengal. I assure you My Dear Mr Buckland that those chimerical ideas of returning home one day or other with a large fortune are not mine: fortune is certainly due after long services, but that which I wish to gain is instruction and reputation. You have more than once been able to judge whether this is the case or not. The advantages of

going out as a Writer would be; that I could get attached to the missions or, if you choose, embassies placed at the courts of the Rajahs or princes in the interior; by this means I would be able to study carefully that country around, and not by post as if I was attached to the army, which I must be if I go out as Surgeon. Such is the account I receive from several persons who have lived in India: and as the place of Assistant Surgeon which I now have is nearly equivalent to that of Writer, I am confident you may be able to procure the change I ask, either by your own friends or your friend's connexions. If I can arrive at this desire, I shall conceive myself the happiest man living: if not I must accept my medical situation, the disgust of which will [~~'hasten deleted]~~ make me forget and perhaps dislike science in every shape and probably being in bad health which may soon put an end to a life which might be rendered useful. You mentioned Miss Morland's uncle as an India Director, perhaps he could do something: I expect the niece will use her influence on my behalf. However you will know best how to manage, and with the zeal you employ I am confident of success. If there existed a lower civil situation in the Company's service I would not dare to ask for that of Writer, but no such place exists. You may ask if the education I have received is sufficient for to aspire to such a situation: I will only observe that I have [~~'been' omitted]~~ brought up in the best classical establishment in Ireland (that of Armagh) and that [~~HOLE IN LETTER: prob. 'since leaving'~~] School Science has not engrossed my entire time, but that my moments of relaxation have been employed in reading History and other branches of literature [*sic*]. Relying on your exertions I will say no more, except that I shall be always grateful for yr. past kindnesses, and hope that [~~'with' deleted]~~ our correspondence (which has been so instructive for me) will not end with my departure from Europe.

I have received Mr Cuvier's first volume, which he desires me to present you as a mark of *Esteem* and *friendship*, & as a small token of his RECONNAISSANCE (which cannot be translated) for the services which your zeal has rendered to Science in general, and to the Study of fossil bones in particular: besides he says that he is glad to acquit a debt for the exertions you have made in rendering his work more complete than it could otherwise have been, by the generous sacrifice you have made of some of the most valuable specimens that the Jardin du Roi has ever received. I cannot send it by the Courier, being too large, but will bring it [~~'with' deleted]~~ myself.

I am not yet decided what day I will leave Paris, but it will not be later than the 9th of August so that you will be able to answer my letter by writing by Post. I shall bring with me the cast of *Palaeotherium* &c addressed to the British Museum, your part will be in the same box, as well as a series which Mr Cuvier charges me with for the Governor General of India. By this means I hope to get [~~'my' deleted]~~ our specimens into England duty free. I hope to be able to visit Oxford before my embarkation for India. If I have time I shall also go to Bath and Bristol and stop a day or two with Mr Conybeare:¹¹⁴ I would be glad to have letters from you for Sir Everard Home, and any other persons that may be open to me in London such as Mr Colebrooke Barrow of the Admiralty.¹¹⁵ Mr Lambert. [*sic*]⁸¹ If you should have many letters to send, send them by the mail addressed me, and to the care of Mr Heuland,⁸⁵ 27 Kings St, St James, or still better to Mr Macleay⁹⁰ whose address you know. I shall however expect to hear from you by post before I leave Paris.

Paris 31 July 1821

Believe me Ever Yours Very Sincerely,
J. B. Pentland

To the Revd. Professor Buckland
Corpus College, Oxford

(No postmark)

[Postscript written across first sheet]:

In case of my not succeeding in getting the Writership in India, I would prefer going to New Holland in the situation which you think I could easily get from our Government. In case you cannot do any thing for me in forwarding my pretensions to the Writership, I will then beg of you to do what you can to get me out to New Holland as soon as possible, as a residence in London at the same time as it will necessitate considerable expense, will also be of very little utility to me. If you can give me letters for the people at the Foreign office, that may set the business a going,

but if [?] you can do more on your return from Scotland [*sic*]. Do you know Mr Croker,¹¹⁶ will he be of any service to me. I shall deliver the letter you gave me 12 months ago to Mr Ricketts.¹¹⁷

XV

My Dear Sir,

I was out of town when your kind letter of the 24 Ult. came to hand ['which' deleted], enclosing yr. deluge paper which according to yr. desire I immediately handed over to Cuvier. I am much indebted to you for being the cause of Mr Conybeare's writing to me, whose letter I cannot answer before 10 days at least, as I shall be obliged to make some researches on the anatomy of the muscles of the Crocodile & other reptiles so as to be fully en état to answer to some of his objections. However I am glad that he adopted my, or rather Cuvier's, opinion as to the position of the nasal openings placed before the eyes of the Ichtyosaurus, and my opinion on the identity of the Coracoid apophysis. Mr C.¹¹⁸ does not yet seem to me to fully understand the composition of the Sternum of the Monitor, I shall send him sketches of them in my letter which are so much superior to verbal descriptions. I am now busy with a dissection of a bear which will yet keep me 8 days after which I shall set to, in order to answer Mr C's¹¹⁸ letter. I shall also be obliged to examine, more carefully than I have hitherto done, the mode of dentition of I'saurus as Mr C.¹¹⁸ holds out for an opinion which, although not very different from my own, is still such as to require to be established on unequivocal proofs. The reasons which I shall bring forward in support of my opinion that the I'saurus is more nearly allied to the Monitor, Iguana Lizard &c. are principally deduced from the structure of the Trunk, and from the head, but I must also admit that in many points there exists a resemblance with the Crocodile; now to be able to establish my opinion I shall examine those parts or organs most essential to life, and in my research I am necessarily obliged to study the soft parts of the Saurian trunk, on which little or nothing has been published hitherto.

I am very much pleased with Mr Conybeare's manner of writing, and am really astonished at the progress he has made in so difficult a subject with so few means. Although young in the business, he will far outshine Sir E. Home, who to his many insignificant memoirs, has just given a most stupid one of the Dugong.¹¹⁹

I shall be much obliged to you for the copies of yr. deluge paper which you promise to send me. I told Brongniart & Cordier that I should give them one from you. I am really astonished to say that I have scarcely time to read it. I am at the Garden from 6 A.M. to 8 P.M. every day, busy either dissecting, or picking out Montmartre fossil bones at which Cuvier is now working. He has made out 7 species of Parisian Anoplotherium, c. 8 or 9 of Palaeotherium, besides 2 entirely new genera of Pachydermata, all from the plaster quarried of the environs of Paris, besides a new genus of Carnivorous Animals. To the catalogue may be added three other species of Anoplotherium 2 of which, found in the coal near Genoa, although very different from the species of [deletion] Paris at first view, seem on further examination to offer one of those Anatomical links between fossil & living species, the Anoplotherium & Hippopotamus. The third species comes from Gascony. In Palaeotherium the species out of Paris are more numerous. I should suppose in all the genus Palaeotherium will reckon 15 species, including those of Paris.

I spoke to you in my last letter of a new discovery of the remains of the Gigantic tapir mixed with those of Rhinoceros & Mastodon near Orleans. Another locality has been since discovered in the same country but hitherto has only produced fragments much inferior in point of preservation to those of the first ['locality', and 3½ ensuing lines deleted: 'Mr Greenough has passed through here on his return from Italy. I am sorry to say that seeing and conversing a little with him has not gratified that opinion which the perusal of his interesting book¹²⁰ has caused me for form'.] I was to dine with him at Brongniart's, but preferred a friendly invitation to dine at Cuvier's in the family way. G. called on Cuvier, he was invited to come and spend the Evg. there yesterday (Saturday) but did not come, I believe because he was obliged to leave Paris next morning. On this you will have seen him I suppose in England. I offered to be of any use to him when in Paris in my power, and fortunately he did not once accept my offer. He promised to

carry a small parcel of fossil shells for you, which I promised to send you some time ago, but he never gave me any notice of the day of his leaving Paris.

I shall write to you a long letter this week by the French Minister's Courier, I hope you will excuse its object, until then Adieu

Believe Me Ever
Yrs. Most Sincerely,
J. B. Pentland

P.S Have the goodness to put the enclosed letter into the Post Office for Bath. It is from a young lady, a relation of mine.

Are the Drawings of yr. fossil Rhinoceros' bones from Warwickshire nearly ready?

How is poor Leach getting on?

Is it *true that you are coming over to Suisse???*¹²¹

To

The Rev. Wm Buckland, F.R.S.

Professor of Geology,/Corpus College/Oxford

Postmark date
Ju 22 1821

XVI

Paris
Jardin du Ros
8 July 1821

My Dear Mr Buckland,

I wrote to you this day week enclosing my reply to Mr Conybeare's kind letter, and proposed sending the remainder today, but have not been able to finish soon enough for the Courier, so that I shall not be able to send it sooner than Friday next by the French Minister's Bag: in order to reply fully to the second part of his letter, I was obliged to pass in review the entire osteology of the Reptiles, and that of the Cetaceous Animals, and Cartilaginous fishes, & to study the most essential points of the soft parts of those Animals.

Mr Cuvier has made out fully and fairly all Miss Morland's drawings. Yr. specimens of the Pelvis & Humerus are extremely interesting. The antick [*sic*] Rhinoceros is ['finally' deleted] finished and sent to the Press. Cuvier's first volume will appear in the course of the present week or very early in the beginning of the following.

Brongniart is very highly pleased with your Alpine paper.¹²² You differ from him on some few points, but as to the great essential ones you & he agree perfectly. He has read his his [*sic*] paper on Monte-Bolca & Northern Italy, which I shall send you as soon as I can get proof sheets which he has promised to give me. Young Brongniart¹²³ has also read a very interesting paper on the fossil plants of the Tertiary Strata, and especially on those of the neighbourhood of Paris. Cuvier intends to publish that part which relates to Paris, in the second volume of his new edition which will contain the Rhinoceros, Tapir, Damas,¹²⁴ Horses and Hog genera, and the Geology of the environs of Paris considerably augmented by Brongniart, who has a great deal of new matter to add to this.

I shall send you a paper this day week on the Geology of the neighbourhood of Vienna, by a Mr Prévost,¹²⁵ which will interest you, as also a short notice on the affinities of the Trilobites by a pupil of Mr Brongniart.¹²⁶

Young Brongniart has heard that your Stonesfield slate is full of fossil Plants and, as he is preparing now a paper on those inferior to the Chalk, he requests me at the same time as his father to beg of you, if they ['be' deleted] are so common, to send him some specimens which may enable him to speak of this locality in his paper, until he shall have been able to visit the English collections himself, which he intends doing in a couple of years.

I am very glad to hear that your class is so fully attended this year; it is a very favourable prelude towards the prospering state of Geology in Great Britain, and offers a strong instance of what exertion & perseverance on your part can do to render agreeable to the first people of our country

by your lectures, a science more pleasing in the field than in the Cabinet. Cordier¹⁰¹ has not more than 30 pupils this year although his lectures are gratuitous, where every person may step in & sit down. This forms a striking contrast of the wish to learn in the two countries, but I must say that a great deal of this depends on those who deliver the Lectures. Cordier has began [*sic*] a course of 32 lectures, in which he intends to treat merely of the Mineralogical composition of rocks, and of their artificial classification, as every classification founded on Mineralogy alone must be.

Let me know what Mr Conybeare thinks of my letter—and as you will soon be leaving Oxford during the Vacation, where I must address my letters to you.

Mr Hope¹²⁷ has told me you intend to come over to France, Is this true? and when will you be here?

We have had Mr Davies Gilbert or Giddle¹²⁸ here: he has left Paris full of the idea of establishing in England such an institution as the Jardin du Roi. It appears that he has a good deal of influence with the Ministers on scientific subjects.

The news of Buonaparte's death arrived here last week, and has made no sensation, which shows how much that man's conduct has rendered all people callous hearted towards him.

Mr Webb,¹²⁹ an Oxonian who travelled with Greenough, who knows you, desires to be remembered to you.

Adieu & Believe me
Yrs. Ever sincerely
J. B. Pentland

Monday 9 July, 1821

To the Revd Professor Buckland F.R.S.
Corpus College, Oxford

(Postmark illegible)

XVII

Paris 29th October 1821

My Dear Mr Buckland,

I received your kind letter of the [gap] ult. a fortnight ago and immediately delivered the note contained therein to Mr Cuvier. I wd. have answered it sooner had I not been very unwell and am only now getting up after a severe attack of intermittent fever combined with a violent bowel complaint, thank God & Dr Robertson's assistant¹³⁰ I am now so far recovered as to be able to go to the Garden of Plants with this letter. I have still some remains of my bowel complaint which I hope will soon go off. I was very sorry to hear of the accident which has happened to you, as was [*sic*] Mr Cuvier's family to whom I related it. Underwood, who has just returned (full of Welsh Geology & with no small opinion of his own geological labors), tells me that when he was in London you were then going about, so that by this time I suppose you are returned to Oxford. Underwood it appears has examined the Island of Angelsea [*sic*] with a Mr Henslow¹³¹ whom he considers a very great man, but in his opinion the Geological Colossus of England is the Cambridge Professor Mr Sedgwick¹³² who is his friend, & who has lately written a paper on the Geology of Cornwall¹³³ which on reading I have found mediocre for a University Professor. I see that Underwood has a strong prejudice against you and Mr Conybeare, at least I fear your friendship with Greenough, whom he considers as a blockhead & whom you I think very justly appreciate,¹³⁴ has been the principal cause; however it is rare that two of a trade agree, not that I wish to compare you or Mr Conybeare to Underwood, who is a mere Tyro and a very superficial one. He is ['not' deleted] ridicules [*sic*] the idea of Mr Conybeare's working on fossils. I presume this sentiment is not his own, but that it had emanated from Bedford St or Lincolns Inn fields. He has however spared his sarcasms on Mr C's¹³⁵ Ichtyosaur paper, since I have proved [*sic*] to him its merits & its ['was' deleted] even its imperfections [*sic*].

It appears that Webster⁴ & Sowerby¹³⁶ are at war in England about the Geography of the Isle of Wight.¹³⁷ I depend as much on Webster as on any man for correctness of observation which constitutes the better half of the Geologist, but as to germs [?] and ingenious inductions I fear he is behind many. As to Sowerby he is a Charlatan, and in the numerous works he has published, there neither exists science, genius, or philosophical views. Besides I should be strongly inclined

to consider him one of those men who would wish to make a great book & found a gigantic reputation of the flaws or errors which have escaped his predecessors. As to Webster's paper on the formations above the Chalk, and more especially on those of the Isle of Wight, it has been judged both in England by people capable of so doing, and on the continent by those whose studies, more particularly directed to those more recent but no less interesting formations, have it more in their power than most geologists to judge of such an undertaking. This judgement, which is already registered in the preface to the *Recherches sur les Ossemens fossiles*, will undoubtedly be brought forward with more force in that part of the work which treats more particularly of the Tertiary formations.

You may be astonished at not seeing the 2nd volume of Cuvier's work appear sooner; it is entirely owing to the plates [of' deleted] relative to the Geology of the neighbourhood of Paris, which are not yet finished. The text is already printed and I shall send you probably by next carrier the proof sheets of the part which is specially dedicated to fossil animals & which comprehends the Rhinoceros, of which there are now 4 if not 5 *living species* & at least 4 fossil species. Consequently two more of the former than are spoken of in the 1st edition, & 3 more of the fossil. We have now a fossil species lately discovered not larger than a tapir & another the size of the common Rhinoceros, both of which possess Incisors like the living species of India & Sumatra, whereas the other two are entirely deprived of such, as in that which ['now' deleted] is now peculiar to Africa.—The Article on the Tapir is considerably augmented by the descriptions ['of the' deleted] & figures of the Malayan species which differs from that of America more than the Tiger differs from Jaguar, or Lynx from the Ocelot as far as respects his color and osteology, although both evidently must be placed in the same genus. After the living species Mr C.¹³⁸ describes the extinct ones, which are 2 in number & which both exceed considerably even the Rhinoceros in size, if we can judge from the fragments which have been preserved. To those follows the new genus *Lophiodon* which includes nearly 9 species intermediate between the Tapir & the Palaeotherium, some of which in the first edition were confounded with the latter. To complete the history of fossil as well as living Pachydermata or rather to serve as object of comparison for the Parisian fossils, Mr C.¹³⁸ describes & figures the osteology of the Horse & Hog.—The second part of this vol. [deletion] is occupied by the Geology of the environs of Paris, to which Brongniart has considerably ['has' deleted] added, especially to that part which relates to the chalk; he will give upwards of 12 new plates, the greater number representing the fossil shells & invertebrate animals in general contained therein, most beautifully rendered by Lithography, which he has established himself at Sèvres.—The impression of the 3rd Vol. is already considerably advanced, Mr C. having already finished his manuscript, so that the 2nd & 3rd vols. will appear very nearly if not at the same moment.

Since I last wrote to you we have received at the Jardin du Roi many most valuable augmentations to the Zoological & Anatomical collections. We have just received 15 large boxes from the matrix made by Mr Cuvier's son¹³⁹ when with Sir S. Raffles, in which are 5 complete skeletons & 4 skins of the Sumatra Rhinoceros, a male & female Malayan Tapir (skeleton & skin), the Dugong, the Indian Buffalo, besides innumerable skeletons of Apes & other smaller animals. The collection of Birds is really magnificent, that of reptiles & fishes less numerous, so that the momentary loss of the collection seized by Sir S. Raffles has been amply made up by the zeal of those ['two' deleted] gentlemen.¹⁴⁰

As to geology, little has been done here since my last letter. Brongniart will soon publish his paper on the Vicentin, with charming lithographic plates of the fossil shells of Rouen, which I am sure will please you. His work on Trilobites is also very near appearing; the plates are also in Lithography.

I am extremely sensible for [*sic*] the kind interest you have taken in my projects on India and am only sorry that there is so feeble prospects [*sic*] of their success. I must then content myself with my place of Assistant Surgeon there or accept employment elsewhere; this latter I would certainly prefer could I but get over the consent of my relations, and their express desire of my establishing myself in that part of the world. No where do my natural feelings turn to with more pleasure & prospect of success than to India, no where would I find more ample protection in my pursuits and labours than in the person of the Marquis of Hastings¹⁴¹ who, passionately fond

himself of Natural history in general & of Zoology in particular, could afford me more efficacious means of rendering service to science, in [deletion] a country so interesting under every point of view & so immense in geographical extent; & so little known to Europe than the Governor General who is literally [*sic*] the king of the country. I would be more specially placed in an advantageous position as I am intimately acquainted with his sister the Countess of Granard¹⁴² who has already given me letters to Lord Hastings of the warmest nature.—I have also from the hand of Lady Hastings very warm recommendations to his niece, besides to other members of the family. It would, I am sure, be very nearly useless to think of going out to India as medical man and then think of neglecting my more immediate duty, by sacrificing it to my scientific pursuits, nor do I suppose such would be tolerated. I think I might be able to have the situation which was offered to me 4 months ago by a foreign government but, be assured, I have patriotism enough, perhaps in my case too much, to accept of anything of this kind before offering my services as home: as to your proposal of going to New South Wales, it is very tempting, being perhaps the amplest field of research [*'for'* deleted] in Zoology & geology, both my favourite pursuits. [*'As to botany'* deleted]. My ignorance of Botany you seem to fear might be some objection to my getting forward, but I presume that science is cultivated at success [*sic*] by the Medical people attached to the Establishments at Sydney & Port Jackson, & you know in what consists a travelling Botanist, he is almost a complete machine for collecting & drying plants which in his Cabinet he will hereafter describe, not like the Geologist or Zoologist, both of which, especially the former, must study in the field—and the latter in the interior of his animals, which cannot be done elsewhere than on the spot; besides the Botany of the Coasts of New Holland has been already investigated by several very great Naturalists (Brown,¹⁴³ Labillardière,¹⁴⁴ Gaimard¹⁴⁵) whereas the Geology has been by none, & the Zoology by the sedentary Cabinet naturalists of England such as Pennant,¹⁴⁶ Shaw¹⁴⁷ & Latham,¹⁴⁸ the field in both those sciences . . . is immense, and, with little expense, great additions might be made to our national collections. If employed with 2 or 3 [*'such'* deleted] people under me I am confident that in a few years I could send home such collections as would astonish. I would propose to take with me a preparer of animals from Paris, who could be had for £150 a year and who could instruct others in his art; this would be the principal expense besides my own salary and a provision which I would require to be made for me hereafter.

I presume no man would have more in his power than Sir H. Davy:¹⁴⁹ as to Mr Giddy,¹²⁸ I knew him in Paris, and was as civil to him as possible. If you should see him you perhaps would speak to him. He will recollect me as having breakfasted with him at Cuvier's, and as having showed him through the Establishment in company with Cuvier & Humboldt.

I will remain in Paris until the 2nd week in December, so that I shall expect to hear from you—your plaster models are already packed up with my own and those of the British Museum, addressed to this latter—I shall send them to Calais as soon as I am recovered. I have written to Konig¹⁵⁰ to unpack them, and put aside your part, each specimen to which has your name written upon it—How is Leach? what do the[y] intend doing with his place at the Museum? Pray have the goodness to excuse me to Mr Conybear for not executing his commissions sooner—but I shall not fail to bring the books he wishes to have with me when I go to England. I would be much obliged to you to send me 5 or 6 of your tabular view of the stratification of the British Isles, as several people have been asking me for it—I sent you by Mr Webb¹²⁹ a paper on the neighbourhood of Paris by M. Héricart de Montferrand.¹⁵¹

Mr Cuvier's own daughter is just recovering from a very severe attack of inflammation of the stomach—she is now well.

Adieu my Dear sir,
Believe me Ever,
Yours very sincerely,
J. B. Pentland

To Revd Professor Buckland,
Corpus College
Oxford, England

[Last paragraph written crossways on the first sheet]

I read in a Periodical of Scotch publication that a very large skeleton of a Whale has been found in a fossil state near Linlithgow, not far from Edinburgh, and that it is now placed in the Museum of the latter city.—As Cuvier intends treating of fossil Cetacea, he would be extremely obliged to you if, through Jameson¹⁶ or any of your Edinburgh friends, you would procure him a drawing of it & especially of the head—knowing no person intimately enough himself.

XVIII

Pencil date '3 Nov. 1821'

My Dear Mr Buckland,

I send you enclosed two Geological papers by Mr Prévost¹²⁵—who begs me to present them to you with the letter—he is a young man who promises fair in the Geological career, especially as relates to the more Modern shelly beds. He is a pupil of Brongniart.

I am getting round slowly—although advised to go to the country—I cannot decide my self to separate from the Jardin du Roi—where I am always learning, and as I never shall have hereafter such an opportunity.

I learn that Mr de la Beche³⁷ has purchased at *Villers sur Mer*, 5 leagues from Honfleur, a series of 17 vertebrae of fossil Crocodile,—Mr Cuvier desires above all things to have a drawing of them, if Mr de la Beche does not intend publishing them himself—as Mr Cuvier has the jaws of ['the' deleted] an animal found nearly at the same period on the same spot, which probably belongs to the same specimen as the 17 vertebrae.

Your plaster casts shall in all probability be sent this week if I shall have time to finish packing them—I have got a copy of Cuvier's Work for Clift, it could not be better placed.—As to Miss Morland's copy, Cuvier has not spoken to me of it since—you know I could not ask him for it with propriety.—As to the copies of the Plates you shall have them in 10 days—I shall send 15 of each.—

I am now going to the opening of the Chambers to escort Madame Cuvier, so that I am obliged to close my letter ['resting' deleted], assuring you of being

ever Sincerely Yours,
Jos. B. Pentland

Jardin du Roi
Monday 3 Nov.
1821

Revd. Professor Buckland
Corpus College
Oxford

[Note in another hand (Buckland's ?)] Bone cement

XIX

My Dear Mr Buckland,

I have this moment received your very kind letter of Nov. 18th inst. and immediately communicated to Mr Cuvier the contents, who begged me to give him your letter and at the same time to write to you in all haste, to endeavour to procure for him some of the bones¹⁵² found in such quantity in Yorkshire, either by exchange or by buying them, especially those of the Rhinoceros, Hippopotamus & Hyena. The quantity of this latter seems to be very great, and as Cuvier is now at that part of his work which treats of the Carnivorous animals, no present could be more acceptable to him, or more useful to science, since he would be able to compare them with all the known species, especially that discovered in Germany & in France. As to the Rhinoceros you will be particular in endeavouring to procure good specimens of the head so that in yr. paper you can positively determine if it be to the Siberian species (*Rhinoceros Calirhinus*)¹⁵³ that the Yorkshire one belongs. Neglect no bone or no atom of bone; bring away all you can find. It is a very interesting question to determine if the Hippopotamus of England & of Northern Latitudes is perfectly homologous to that of Italy—this you will easily determine if you find any

specimens of the Head or of the long bones of the extremities, & bones of the Tarsus & Metatarsus & of the Carpus & Metacarpus—you being on the spot may be able to collect sufficient materials for the construction of Skeletons, and in case you do, I promise to go sooner to England than I intended and get them up for you.

In résumé collect all you can find, especially of the Hippopotamus, Rhinoceros, Hyaena & Elephant, as by so doing you will be able to render a service to Science and oblige your friends.

I am sorry to learn that Leach still continues so ill. I shall write to you at Oxford respecting my plans with regard to the British Museum.

In haste, Believe me Ever
sincerely yours
Joseph B. Pentland

Paris 24 Novr 1821

[originally addresses 'To the Revd. Professor Buckland' at Kirby Moorside, Yorks: redirected to 'Corpus College, Oxford' by another hand.]

XX

Institut de France
Academie Royale des Sciences

Paris, le 26 Novr. 1821

Le Secrétaire perpétuel de l'Academie

My Dear Mr Buckland,

I this morn. received your kind letter of the 18th inst., and immediately communicated its contents to Mr Cuvier, who desires me to write to you in all haste in order to request you to procure for him if possible some of the fossil bones lately discovered in such abundance in Yorkshire, especially those of the Hyena, as he is now engaged in that part of his new work which treats of fossil Carnivores. Besides he intends at the end of the 3 vol., which is now printing, to give a supplement to what precedes and, as he will have a good deal to say on some late discoveries of fossil Rhinoceros—and to describe the osteology of the Sumatra living species¹⁵⁴ lately arrived, he will be extremely obliged to you for any details or specimens you can send or lend him of the Rhinoceros or of the Hippopotamus. [‘you’ deleted] If you go to Yorkshire, examine carefully if any remains of the smaller species of the genus *Mustela* are found—or of the *Glutton*,¹⁵⁵ the only two animals wanting to complete the similarity between the Yorkshire Caverns & those of Gaylenreuth. As to your opinion that this is the first example of a mixture of the remains of Carnivores & Graminivorous Animals, you do not perhaps remember that the fossil species of Hyena discovered in Fauvent in France was accompanied with bones of Rhinoceros & Horses. Those latter were found with the bones of Elephant & Hyena in the celebrated depot of Canstadt in Wurtemberg [*sic*] and I myself last winter [1820] discovered teeth of a very large species of Wolf—in the [‘Nice’ deleted] Bone Breccia of Nice & Ceuta.—Those are the principal exceptions I recollect at this this moment.—Endeavour to procure good specimens of the long bones & of the Head of the Hippopotamus & Rhinoceros, in order to establish with certainty if they belong to the same species as those already known.—The most interesting question which you can thus resolve, is if the Hippopotamus of Yorkshire differs from that of Italy? and if the Rhinoceros resembles more to that of Siberia than to the Italian species.—As to the bones of the Stags, you will endeavour to procure portions of the Horns, the only parts on which one can pronounce with certainty.—The fossil species of Horse will perhaps present some specific differences (which have not as yet been perceived) when the head shall have been once found complete.—The Water rat of which you speak is in all probability very different from the *Mus Aquaticus* of Systematick [*sic*] authors.—I am very happy to hear that you intend paying a visit to Yorkshire—it is Mr Cuvier’s sincere wish that you should do so, and he desires me to advise you to it in his name.—The Yorkshire Cavern¹⁵² will now become no less celebrated than those of Gaylenreuth & Schartzfeld¹⁵⁶—and the product is in your hands & may give origin to as interesting a work as those of Escher⁸³ & Rosenmüller.¹⁵⁷ I am confident Mr Cuvier will afford you every assistance in his power. I have written to you at Kirkdale in Yorkshire, in hopes you may hear from me when on the spot.—

Institut

de France

Académie Royale

des Sciences &c.

Paris, le 26 Nov^r 1821

Le Secrétaire perpétuel de l'Académie.

My Dear Mr Buckland,

I have just received your kind letter of the 18th inst, and immediately communicated its contents to Mr Cuvier, who desires me to write to you in all haste in order to request you to procure for him if possible some of the fossil bones lately discovered in such abundance in Yorkshire, especially those of the Hyæna, if he is now engaged in that part of his new work which treats of fossil Carnivora. He is at the end of the 3^d vol which is now printing to give a supplement to what precedes and as he will have a good deal to say on some late discoveries of fossil Rhinoceros and to describe the skeleton of the same & the living species lately arrived, he will be extremely

Facsimile of the first page of Pentland's letter of 26th November 1821. (Reproduced by courtesy of the Manuscripts Dept., University of Nottingham).

I am extremely sorry to hear of poor Leach. As to the Museum, if the thing is worth having and if I get my parents' consent,¹⁵⁸ my health continuing good [deletion], at Mr Cuvier's request, it is my intention to apply for it. I hope that you will exert yourself with your friends, and advise me how to proceed without being obliged to go England. Lord Granville¹⁵⁹ might ['give' deleted] be got to assist me with your interest.—I presume I shall run as fair a chance as another, and in

case of not proceeding shall be able to console myself without difficulty.—Mr Cuvier will write to Mr Davy¹⁶⁰ on the subject.

Shall I send you the Metallic thermometer, it costs [blank space]. There is no pen portrait of Humboldt.

Excuse this official paper, it being the only one I could find at the moment of writing. Brongniart has already figured the Trilobites of which you sent him the drawings and from the same locality.

Could you procure [deletion] Mr Conybeare's paper on Ichtyosaurus for Cuvier, if not I shall give him that which Mr Conybeare sent me.

Ever Most Sincerely Yours,
J. B. Pentland

Jardin du Roi,
Novr. 26 1821

XXI

Pencil date Dec. 3 1821)

My Dear Mr Buckland,

I wrote to you by last Courier informing you of my intention to place myself in the list of Candidates for the British Museum in case the place was worth having. Before proceeding farther I request you to give me your advice on the subject. I am sorry you are already so far engaged for Mr Miller,¹⁶¹ however I fear, poor man, he has a very poor chance, when in competition with Horsfield¹⁶² & Stevens⁷⁷—I have seen his work, it is not held here in great estimation. We have a Mr Orbigny,¹⁶³ most assiduous Naturalist, who is working on the same subject, but God knows when he will publish as he is as poor as a Church Mouse.

I wrote to you concerning the fossils lately found in Yorkshire in order that you might get some for Cuvier, who promised me a letter for you, but has been obliged to go to the King at the moment of writing it.

The casts of fossils left this 10 days ago for Calais, and are ere this I hope in London. Your pack is not in a separate box, but in a common one for the Hunterian & British Museum. I have written to Rouse¹⁶⁴ & Clift in order that they be sent to Oxford as soon as possible—I did not receive yr. letter wishing to have them put up separately until last Friday.

Give me any advice you can relative to the British Museum, the footing the Keeper is placed on, the Emoluments, as to the duties they are very great.

I am getting better, and will soon be as well as Ever.
Believe Ever sincerely

Yours

J. B. Pentland

Jardin du Roi
Decr. 3 1821

Postmark
Dec. 10 1821

To the Rev. Wm Buckland F.R.S./Corpus College/Oxford

XXII

[Pencil date 'Dec. 3. 1821']

My Dear Mr Buckland,

I have just time to say a word to you. Mr Cuvier desires me to say that you may have the casts directly of a part of yr. fossils, so if you will, you may have them sent immediately. Let me know what you wish.

Would you wish to have some specimens of the Freshwater Limestone in which the Palaeotherium has been discovered near Strasbourg and in the South of France—I can send them to you.

Do you think which [*sic*] wd. be better, to send a cast of the Palaeotherium's head to the British Museum or the Hunterian collection, as we intend sending one and wish to know in what publick [*sic*] collection it wd. be more usefully placed.

When Mr Conybeare's paper appears, will you let me have a look at it, as no body here gets the Geological Transactions until long after their publication.

Mr Cuvier, Brongniart & Cordier give their best regards to you.

Believe me in Haste
Yrs. Sincerely,
J. B. Pentland

Have you received yr. diploma of Correspondant,¹⁶⁵ it was sent 15 days ago to Mr Macleay.
Professor Buckland
Corpus College
Oxford

XXIII

Paris 7 Decr. 1822 [should read '1821']

My Dear Mr Buckland,

Mr Cuvier desires me to thank you in his name for yr. kind attention in procuring for him Mr Miller's Work¹⁶⁶ which he has only received this morn[ing] with Mr Conybeare's paper. I will write by next courier to Mr Conybeare. I have not had time to peruse Miller's work but shall this Ev[ening]. [evening] and will write to you my opinion on the subject. I fear his ideas on Mr Cuvier's classification of the Encrinurites [*sic*: should read 'Encrinurites'] caput medusarum [*sic*] are not well founded.

Mr Prévost has just read a very interesting paper at the Institute on the horizontal Strata of the N.N.W. coast of France from the mouth of the Somme to the inclined or Transition Strata of Brittany—he has identified the different Strata with those of England after your table & Greenough's map—and I am sure you will be pleased with it, I shall send it to you as soon as published.—He finds that the Strata which contains [*sic*] the Honfleur Crocodile corresponds to your Purbeck beds or thereabouts and that it is separated from the Lias which contains the Ichtyosaurus & Gryphaea *incurva*¹⁶⁷ with Pyrites—by the entire mass of the oolitic formations which forms [*sic*] the Caen building stone—and which near this latter town passes to the coral rag & the other members of the oolitic formation.—The bed which contains the Honfleur Crocodile is principally characterised by a small species of Oysters or Gryphites which Lamarck¹⁶⁸ describes under the name of Gryphaea Augusta¹⁶⁹—this shell frequently adheres to the bones of the crocodiles.—In different parts of the basse Normandy this shell becomes so frequent that the entire rock appears made up with them and is then called *Lumacheles* [*sic*: more usually 'lumachelles']. It is also found near Boulogne sur mer. In all the French strata, salt or gypsum does not appear in the horizontal strata and with the Lias or a bed which may perhaps represent the Magnesium Limestone, if it did not differ so strikingly in stratification from the red sand on which it reposes—the inclined strata follow to the Lias & are composed of sienite [?] Porphyry (rare) & red sandstone which appears ever superior to the two former, so as to authorise the supposition that these beds have been thrown out of their natural position so considerably as to get even beyond the vertical direction, supposition which Cordier has lately held out to explain those anomalies of position described [HOLE IN LETTER: prob. 'by'] Brongniart as the Italian Eupholid [?] &c [HOLE IN LETTER].

Very little new in fossils, except that we have just received the 3 metatarsal bones—the Atlas and cubitus [?] of a very large species of Rhinoceros from the environs of Abbéville which we have every reason to believe belongs to the Rhinoceros Incisirus Cu., Lately discovered near Orleans, and of which I shall send you casts of the incisors & of some of its molars.—By the bye, have you received the casts of fossils I sent to home [?] 5 weeks ago—I write to König by this courier on the subject. Have you been to Yorkshire, and what has been the result of yr. voyage—Mr Cuvier hopes you will not have forgotten him. We have just discovered at M. Martre [Montmartre] a new animal of the genus Viverra, more nearly allied to the Javanese & Madagascar species than to any other living ones, but very different in many respects from both. Any news about the museum? My memorial will be presented shortly to the Archbishop¹⁷⁰—Davy has written a polite letter to Cuvier on the subject—and as Müller¹⁶¹ is a German, I have every reason

to suppose that an Englishman & a native will be preferred to a foreigner—if his grace¹⁷¹ [*sic*] does not wish to make the Museum an ['reception house' deleted] Asylum for ['foreigners' half deleted] Germans & such.

Ever sincerely yrs.

J. B. Pentland

To the Revd. Professor Buckland F.R.S./Corpus College/Oxford/England

Postmark

Ja. 11 1822

XXIV

Jardin du Roi

10th Decr. 1821

My Dear Sir,

I wrote to you by last courier, but hearing that an accident had happened to the Courier of the Mail, I beg to trouble you again on the same subject, the nomination of a person in place of our poor friend Leach. As long as any chance of his recovery existed and as long as the Trustees of the Museum did not declare his place vacant, I desisted from speaking of my intention to apply for that situation, but now since it seems decided that he can no longer take upon him the duties of his office, by the vacancy being declared, I cannot allow such an opportunity [to] pass without exerting myself to procure [it]. In so doing I am seconded by my best of friends, Mr Cuvier & family, who ever since poor Leach's illness have not ceased to urge me to demand his place. Mr Cuvier does it with this good intention, that the British Museum & the Jardin du Roi may form two great national members of the same family, by forming a correspondance, and by establishing exchanges which will undoubtedly be to our advantage. As I know the collections of the Jardin du Roi as well as any person here, and certainly better than any one in Gt. Britain, I would be placed in a more favourable position for thus serving the British Museum than any other applicant who might obtain it, and thus be able to raise in a short period of time, with proper encouragement on the part of the Trustees and of zeal on my own, a monument no less glorious ['than' deleted] and useful to my country, than Mr Cuvier has formed in 20 years, the greater part in time of War, at the Jardin du Roi & which, while it serves as a most interesting scientific monument for strangers, shows an unhappy contrast when compared to the British Museum.—Placed as I have been during 5 years in France, 3 of which constantly spent in the Jardin du Roi, in the laboratory of Mr Cuvier, enjoying every facility of acquiring instruction, the keys of the Museum placed at my disposition, with the most unlimited permission of making use of them.—During those three years I have not ceased to work, especially occupied with Comparative Anatomy, the superb collection of Cuvier constantly under my eyes, numerous dissections of animals of all those which died during that period at the Menagerie, and above all the immense advantage which I have reaped from the conversation of Mr Cuvier, in whose home I have been ever received as one of the family.—Add to this that the immense number of drawings formed by Cuvier and Laurillard has been placed at my disposition with [deletion] all the manuscript notes destined to form the great work on Comparative Anatomy of Mr Cuvier. In fine, Anatomy, which should form the basis of Zoology, and Zoology itself have formed the most essential part of my education, and certainly that which is of most importance for the place at the British Museum: not considering as an advantage (if you please) my correspondance with the Jardin du Roi.—The opening that now exists in London for a comparative Anatomist is now very great, as Sir E. Home is going off.¹⁷²—For a Zoologist the opening is no less advantageous.—As to the Candidates for the situation, I without self-conceit may say that not one of them appears to me adequate for the Task—at the Museum, General Zoology is the object, where a single person is charged with the care of the entire Animal Kingdom.—Swainson¹⁷³ is a very poor Ornithologist & Entomologist & does not see beyond specific distribution, and his Brazilian Birds: Dr Horsfield¹⁶² appears exclusively ornithologist & that only of Java, his learning does not seem to extend even to the 3 other classes of Vertebrate Animals.—Stevens¹⁷⁴ is exclusively entomologist. As to Miller¹⁶¹ I do not know upon what he is strongest.—I repeat a man cannot think of learning

Natural History on his entering into the care of a collection: he must be familiar with his subject and especially have seen what is order and arrangement [deletion], without which Zoology is not a science.

As to the Administration & Expenses of such a collection, my long residence at the Jardin du Roi ['allows' deleted] permits me to form an Estimate that the same thing could be done in England for very nearly the same sum as in France. I have taken a long series of notes on the subject, which I could submit to the Trustees if you thought it would be of any use.

The Jardin du Roi receives annually £12,000 Sterling, which is divided into three parts: the Botanical, Mineralogical-Agricultural & Zoological Departments.—Out of this latter the collections of Comparative Anatomy, the Cabinet d'Histoire Naturelle & the Menagerie is supported, Menagerie which contains more living animals than any other in Europe. Add to this that out of the same £12,000—13 Professors and 13 and [*sic*] naturalists are paid upwards of £3,800 Sterling, that the Buildings of the Establishment are repaired &c. You will find that in France the Zoological collection does not cost more than [gap] and, if you examine on what those expenses rest it will be found that they are [deletion] such that in England they would not exceed what they do in France. I am certain that with 3 or 4 thousand pounds a year the Zoological collection of the British Museum would be brought up to a level with that of Paris and that, with & included in the same sum, such a collection of comparative anatomy might be set up as would be essential to the study of Zoology in all its departments, and to the study of fossils particularly; but, for that, a person must be placed at the head who is perfectly conversant with the managing of such an institution—which, as I said before, none of your 4 Candidates can have been. As the French say, en résumé my principal recommendations in applying for this situation are 5 years' residence on the continent actively dedicated to the study of the different branches of Natural Sciences & the last 3½ years constantly employed in the Zoological & Anatomical Departments of the Jardin du Roi (which exceed undoubtedly everything of the kind in Europe), enjoying such facilities as few others have ever been permitted, and placed under the eye of the first Naturalist & Anatomist existing, whose house, Library, Drawings & manuscripts have been at all times open to me: and whose advise [*sic*] has been always given & profited of by me. Add to this the advantage which would result to the British Museum by my knowledge of that of the Jardin du Roi, and the correspondances and exchanges which might thus pass between those two great National Institutions: such are my recommendations and such do I submit them to you, well knowing that you will forward my views as far as is in your power. How much would I be gratified to be established in London, where so wide a field is open and where we might (you and I) render such a service to Zoology & Geology by the description of those fossil Animals which are so abundant in the British Isles. I am sure nothing would be wanting to such an undertaking, as Mr Cuvier would lend for any period to me the objects contained in the Jardin du Roi, so that by those means we might be independent [*sic*] of the other collections of London, which jealousy might shut ['up' deleted] against [us]. If I should succeed in obtaining this situation I sincerely propose such an undertaking to you; my anatomical knowledge on the subject might throw considerable light on the Geology of the British Isles when combined with your Geological observations.—Such an undertaking, with your name affixed to it, could not fail to meet with success.—

My place in India is definitely settled. As I could not procure a nomination to Bengal, I have decided to give my demission—which accompanies this letter today. I have no idea of what I shall do in case I fail in procuring the place at the Museum. I will probably be obliged to accept a situation under some foreign government.

I shall remain in Paris until I hear from you. Mr Cuvier has written to Sir H. Davy a very warm letter in my favour—you will have the kindness to speak with Sir H. on the subject.

I am very anxious to see how this business will terminate. Adieu My Dear Mr Buckland, write by post and do not wait for the Courrier.

Believe Me Ever
Most sincerely
Yours J. B. Pentland

Paris 10 Dec. 1821

Excuse the style of this letter, which has been written in a great hurry.

Paris 17 Dber 1821

XXV

My Dear Sir,

I have this moment received your kind letter of the 4 inst. and am extremely sorry to learn thereby that you can be of no use to me in the application to succeed poor Leach. I may now say that I have nothing to depend upon but my own merit and, such as it is, I am determined to push it as far as in my power, because I see that in case the Museum be filled as you desire, the institution must necessarily be placed in the hands of people who can have few pretensions to the title of Naturalist and still less to that of a curator or Conservator of the first National Museum of the Empire. I am fully determined to employ every means in my power to obtain the situation I repeat, and that nothing may occur in my India views which might be contrary to my interest on the present occasion, I have written to my friends to say that I have relinquished for ever going to India since I found it impossible to obtain a nomination else where than at Madras. I am then thrown upon the world & must needs endeavour to find a permanent situation, if possible. The British Museum presents such a one at the moment, and my reasons for not applying sooner were of a double nature, first my repugnance to apply for the position of a *friend* when still alive, and when hopes might still be held out of his recovery, and secondly my wish to get out to India and the Bengal Establishment, which as I said before has failed and has caused me to relinquish my views in that quarter of the globe. I presume that the opinion of the President of the Royal Society will be of great weight on such an occasion; Mr Cuvier has written to him the warmest of letters in my favour, the copy of which I subjoin that you may see the opinion that this great man has of my talents, of the utility which my services would be to the Museum, and his conviction that no person could fill the place with more interest to the institution and to science than myself. If I shall not succeed, it will not be owing to my ignorance of the duties of that office, which I fear few persons in England are perfectly conversant with since Leach's death. As to your opinion that science would benefit more from my residence in the East than in Europe, I am not entirely of the same ['op' deleted]. I hope that wherever [HOLE IN LETTER: missing words probably 'I may be'] placed my labours may be useful, but in no country is so [HOLE IN LETTER: should probably read: 'well endowed . . .'] as that which offers the Capital of Great Britain. It is a shame to the Nation that its National collection is not really superior to that of the smallest German Prince, when we look at the resources which the colonies & relations of Great Britain present—and you, I am sure, are well convinced that, in the number of Candidates [deletion], supposing them good and professed Naturalists and men conversant with the collateral branches of Natural and Physical sciences, which none of those gentlemen are), not one will employ more activity than did our poor friend Leach, and it is to be feared that what he has done will soon be effaced, and that the Zoological department of the British Museum will fall into the same state that as it was in Dr Shaw's¹⁷⁵ lifetime—in the hands of persons whose education & stock of knowledge does not permit them to appreciate it.—The arrangements of Birds & Insects is the duty of the Conservator of the Museum, I grant, and like every other thing of the kind it may be done in different manners: on that arrangement depends the merit of Naturalist and the science of the thing if I may use the expression, and if I wanted an example in favour of my assertion, I would bring forward the comparative labours of two great Naturalists of the last century Linnaeus and Pallas,¹⁷⁶ and ask which of the two have rendered the greatest service to science—but My Dear Sir we must not judge from what has hitherto passed in the Museum, for although Leach rendered a great service to the Museum, he also respected too much the routine established by his predecessor,¹⁷⁵ who unfortunately looked too much on his place as a sinecure.—With activity, knowledge, and a love of science, I repeat, the British Museum, in very few years, could under a proper person be placed on a respectable footing—and before long rivalize [*sic*] even the most celebrated of the kind in Europe. What an honor to the country and what a service to science, might not the British Museum offer in a short time. I am confident that Mr Miller, who has never seen what a collection of Zoology is, will find himself embarrassed on entering the Museum.—I am sorry that he is your protégé, not I assure you on my own account, but on your own for having recommended a man so unfit for the situation to all appearances. I do not [HOLE IN LETTER: missing words probably 'seek to'] solicit your interest, knowing that you have already promised it to another. But I will ask, as a man conversant with science, to which of the Candidates would you give your note as

a Trustee of the Museum? to a person conversant with the subject or to one who is not? With this question I shall close my letter, and shall for the last time speak to you on the subject—as you can no longer be of any use to me.¹⁷⁷

Mr Cuvier's letter to Mr H. Davy ['Bart, F.R.S.' deleted] I presume will be extremely useful. I would have sent you a copy of it but I suppose you will see it in London; I will only cite one phrase which is 'il est de tous ceux qui je connais celui [deletion] qui possède le mieux les principales branches de la Zoologie'¹⁷⁸ and farther on 'est un moyen presque sur de vous rattrapper dans un[e] carrière ou nous vous avons jusqu'ici dépassé.'¹⁷⁹

I have learned that the bag of Plasters [HOLE IN LETTER: probably 'sent'] for you, the B. [British] Museum and the College of Surgeons left Calais 10 days ago, and thus they should be arrived in London.—Mr Ricketts¹⁷ is now here, he presses me much to go to India. He has been extremely civil to me & in return, I have introduced him to all the scientific people here.

Mr Cuvier has received yr. letter with the drawing¹⁸⁰ of Mr de la Beche; but has not yet heard of Mr Miller's book¹⁶⁶ which you say you sent him. Perhaps they will arrive today by the courier.

Ever sincerely yours,
J. B. Pentland

To the Revd. Professor Buckland, F.R.S.
Corpus College, Oxford

Date apparently De 21 1821

XXVI

Paris 24 Dec. 1821
Jardin du Roi

My Dear Sir,

I am extremely obliged to you for the kind information respecting the application for the place at the Museum contained in your letter of the 12th inst. I shall act as you advise and send certificates & my memorial to the Archbishop of Canterbury.

I am uneasy at not hearing from you or Konig relative to the Casts which were embarked more than a fortnight ago at Calais for the Port of London addressed *to the Trustees of the British Museum*: by this time they must be either arrived or lost, I am sure you will be highly pleased with them. In the course of a month the second part of this collection will be ready & shall be immediately sent; it will consist in a molaris of the Mastodon *Angustidens* lately discovered in the neighbourhood of Orléans, the molaris of the Gigantic Tapir from the same locality, the Radius & cubitus [?] of ['the' deleted] three different species of *Palaeotherium*, and the metatarsal bones of 4 species of the same genus, in order to show the great differences which exist between those animals of the Antidiluvian [*sic*] worlds—the radius & forefoot complete of the *Anoplotherium commune*, as well as many other interesting specimens: in fact I am now charged by Cuvier with the entire direction of the Casting, and nothing worthy of notice shall escape me.

I enclose you a note of young Brongniart which he and his father request me to present to you. I am sure your love for science will cause you to do everything in your power towards the advancement of his views. If any other recommendation was wanting than that of the author of the *Géographie minéralogique des environs de Paris*, I should feel myself no hesitation in giving it.

Brongniart is busy working at the environs of Paris for Cuvier's second vol., which [will] not appear, owing to Brongniart's slowness, until the end of February when the 3rd will also appear & the greater part of the 4th shall be printed—After this Brongniart intends to give a complete history of the Jura Limestone with plates of all the fossils as well as those of the other secondary strata—he has brought the Lithography to great perfection for fossils, as you will see in his paper on the environs of Paris, in which he has figured all the fossils of the Chalk formations, from every country where this latter is known. He considers with you the Diableretz near Geneva & the Montagne du Fils as Chalk, instead of that indefinable Alpen Kalk of Humboldt: you will be astonished to see the inferences (extremely just) which he draws from the identity of the fossil organic remains of this formation.

Mr Cuvier has received a letter from Davy relative to his application for me to succeed Leach. He promises to do everything in his power, but nothing gives me more hope than yr. opinion that

the Archbishop will give [HOLE IN LETTER: 'the'] situation to the best qualified, in which case I run a fair chance of success. However in case of not succeeding, it is almost settled with my relations that I should establish myself in London: having relinquished my views on London I am heartily sorry that giddiness on my part lost me yours & Mr Conybeare's interest,¹⁸¹ but I hope that our friendship will never be broken off for such a cause, in which, if there is a defaulter, I must confess that it is myself: however you in return will not take umbrage at my opposing your friend as far as lies in my power.

We have received Clift's cast of the Ichtyosaurus which is most beautiful. He is now making drawings for Cuvier of the fossil bones of Hyena from the Yorkshire cavern, but hopes that the gentleman to whom the specimens belong will lend them to Cuvier in a short time, after publick curiosity has a little abated. However as you going on the spot¹⁸² you will be able to find others, a part of which you perhaps could send here.

Cuvier & family desire their best respects to you. I have subscribed for Mr Conybeare,¹⁸³ but propose to wait until the 2nd vol. is published in order to save expense & trouble, ten to one I shall be in London before a month.

Ever sincerely yours
Joseph B. Pentland

Jardin du Roi
Monday morg. [Morning] 24 Dec.
To
the Rev. Professor Buckland
Corpus College/Oxford/England

Postmark
De 29 1821

XXVII [Incomplete letter]

. . . both living and fossil—I presume Home will have a quarrel with you if you take up this which he considers as his property—as I have heard he has been very much piqued at Mr Conybeare's paper on the Ichtyosaurus.

Since my last letter no new discoveries have been made in this country, if I except a few remains of Rhinoceros & Mastodon in the South of France & a number of fossil bones for Birds belonging to the genus Ardea (Bittern-Heron, Stork), mixed with innumerable land Helices, in the Freshwater Limestone of Bul de Chateau 5 leagues from Clermont on Auvergne.

Cuvier's second volume has not yet appeared. Brongniart has not yet finished his article [HOLE IN LETTER: should read 'on'] the Fresh water formations.

I have not heard anything of my application for the British Museum. I will send my memorial to the Archbishop next Monday, having been prevented from doing it sooner by a continuance of Bad health—I wrote to Mr Conybeare by last Courier begging him to excuse my neglect in not answering sooner his last polite letter ['I hope to' deleted] at the same time returned him Mr Cuvier's thanks for his pamphlet on Ichtyosaurus which arrived with Miller's Book only a fortnight ago. I did not write to you by last Courier Supposing you still *en voyage*.¹⁸⁴

Believe me Ever sincerely yours
J. B. Pentland

To
the Revd. Professor Buckland F.R.S./Corpus College/Oxford

Postmark Ja. 25 1822

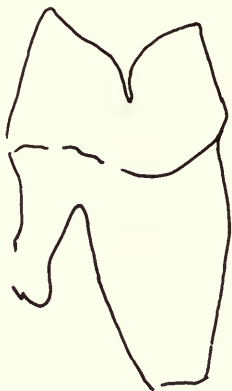
XXVIII

My Dear Mr Buckland,

I received your very kind letter with that of Mr Conybeare, and shall answer this letter as soon as I can possibly find time. Since I last had the pleasure of writing to you, I am sorry to say my health has been considerably worse than heretofore: my bowel complaint has continued to increase, and I now write to London to be permitted to remain here 6 months longer, and to go travel into Italy with a friend ['of' deleted] who will pay my expenses—this friend you know, it is Mr Ricketts, late member of the Supreme Council of Bengal, and nephew to Lord Liverpool.¹⁸⁵

I beg of you not to mention this to any person whatsoever—as Mr R.¹⁸⁶ wishes it so—not even to your most intimate friends.—I need not tell you of what importance this trip will be to me in a scientific point of view, & on the other hand Mr Ricketts' interest with the Government & especially with the East India Company, in case of my being obliged to go out to India at any future period, in case of my not succeeding at [words missing]. Through him I expect to have Lord Liverpool's interest with the Archbishop of Canterbury.

You seem to have misunderstood what I said in my last letter on the Tiger's tooth of the Yorkshire Cavern; it is the inferior & posterior, and not the posterior superior. I am sure that Cliftt [*sic*] could not have committed such an error in his drawing as to deceive us; however, to ['be' deleted] leave no difficulty on the subject, I subjoin a copy of the original drawing, which if correct is, as I said before, the inferior and posterior grinder of a Felis, surpassing in size that of the largest Bengal Tiger.



Your story of the Hyena's excrement in a fossil state has caused no less surprise here than in London. I hope you will be able to spare a part of your stock for the Museum here—Album grocum fossil!—

Webb's¹²⁹ expedition to Spitzbergen astonishes me not a little—I am so much afraid of cold that I would much rather go to the deserts of Arabia to be burned alive, than to the icy seas.—Do you think that Mr Trevelyan¹⁸⁷ & Webb would have any objection to allow a naturalist from the Jardin du Roy [*sic*] to accompany them—they might arrange so that he would prepare all objects of natural history for them, on their allowing him 1/2 for his pains.—I am sure Cuvier would [*sic*] be very much pleased at all events to recommend to them to bring to us the skeleton of a Walruss [*sic*], the skins & heads of the different species of Seals, as without the head it is utterly impossible to distinguish the species.—I shall write to you further on the subject before my departure.

I expect to leave this [city] from the 1st to the 5th of March and shall be much obliged to you for any letters of introduction you can send me or procure for me for different parts of Italy—or any commands you may have.—Our route [*sic*] will be through Turin, Geneva, Plaisenza [*sic*],¹⁸⁸ Parma, Bologna, Florence, Perugia, Rome, Civita Vecchia, Naples [HOLE IN LETTER—word missing probably 'Leghorn'], Pisa, Ferrara, Venice, Verona, Vicenza, Mantua, Milan, Pavia—& different parts of Switzerland.

Believe Me Ever sincerely Yours,
J. B. Pentland

Jardin du Roi
10 Feb. 1822

N.B. We have just received the whole anterior extremity of the fossil Rhinoceros—discovered last week at Abbéville with Tigers (a tooth), Elephants, & fossil Stag. The bones are admirably preserved.

The Revd. Professor Buckland
Corpus College,
Oxford
J. B. Pentland

Care of Mr Macleay Esq.

Paris 25th Feby. 1822

My Dear Mr Buckland,

Brongniart has this moment sent me his new work on Trilobites¹⁸⁹ for you, which I shall send by the Courier if possible, if not I shall send it by Dr Saddli, Professor of Chemistry at Florence,¹⁹⁰ who leaves here tomorrow (Tuesday) for London and to whom I have, at Cuvier & Brongniart's request, given a letter of introduction for you. I shall request him to give it to Clift who will send it to you with the least possible delay.—You will see by this work to what perfection Lithography has been brought here, as to fossil shells nothing can be more beautiful or correct than the Lithographic plate of the fossils of the Chalk formation, a copy of which I shall send you. Brongniart is completely of your opinion on the Black Limestone of Diableretz, Montagnes des Fils &c as belonging to the chalk formation.

I would have desired to send by Dr Saddli the 2 & 3 vols of Cuvier's work, which will not appear before the end of this month—I shall charge Royer¹⁹¹ to send them as soon as published—with the Copy which Mr Conybeare desired me to purchase for him. Mr Conybeare can transmit either before or after the [deletion] amount to Royer. I shall also desire him to send at the same time Brongniart's fossil Crustacea, which I presume he will desire to have, which costs 15f. & Savigny's *Animaux sans vertèbres*,¹⁹² which he requested me to send him some time ago—the amount will be 6-16-6d. Sterlg. or 165 francs.

We have nothing very new here. At Abbéville they are searching after the head of the Rhinoceros, the greater portion of whose skeleton has been found in the same pit, but unfortunately only a small portion has escaped the merciless pick of the Quarry men.—When the pit in which those bones were found [was opened]—the stench was so great that for some time the workmen were obliged to desist.—The sand which envelopped [*sic*] them is strongly agglutinated by the animal matter, and the odour was, according to the workmen, quite as disagreeable as that of putrid animal matter.—This is another proof of the very recent period at which those animals were destroyed, and comes very à propos in confirmation of your conclusion on your Yorkshire den. In the same pit were found the forms of the fossil species of deer similar to that of Breuges and in all probability of Yorkshire & other localities of Rhinoceros. Mr Treullin [?], an intelligent man at Abbéville,¹⁹³ writes that he has little doubt of soon coming upon the head. [This] will be an interesting a [*sic*] discovery, as from the bones which we already have there is every reason to suppose that this Rhinoceros differs from the Siberian species¹⁹⁴ & resembles to that which has been found lately near Orleans, furnished with large incisors like the living ones beyond the Ganges.

I wrote to you respecting any bones of fossil reptiles which you might not intend publishing & which you could send drawings of to Mr Cuvier. I must now make a similar request for those of Carnivorous Animals—have you any well preserved specimens of Hyaenas or Gluttons from the Caves of Franconia, or any of the Glires of Oeningen—your fossil jaw of Didelphis,¹⁹⁵ has it been found to a certainty in the Oolite beds? I doubt it very much as the appearance of Mammalia is of an infinitely more recent date—examine the locality if you possibly can, as we have an animal of the same genus in our Parisian gypsum with the Palaeotherium &c.

I await anxiously my permission from England to start for Italy—in case of receiving it this Week I shall start about the 12th of next month. I will be obliged to you by giving me any indications of the northern parts of Italy—any letters which you may send I beg you to address them to Cuvier's care, who knows all my movements and will forward them accordingly. I shall write to you from time to time, as well as to Mr Conybeare who I regret much not to have known personally—but with whose correspondence I have been delighted; I have not been able to let him keep the head of Iguana which I sent last Monday—for a long time—but before my departure I shall send you a beautiful head of a very large Monitor and which I will allow you to keep until my arrival in England. I must only request that my name shall not be mentioned in the course of your mutual researches.—I hope that you will publish (as soon as you have got over your Yorkshire Den) the descriptions & figures of the monstrous beast which you found in Lincolnshire.¹⁹⁶ Cuvier desires it much, and nothing could be more interesting. By publishing it in the

Philosophical Transactions you will be able to have good engravings made of it, copies of which I bespeak.

Endeavour to forward (if possible) proofs of the Plates of Mr Young's¹⁹⁷ book on Yorkshire,¹⁹⁸ of which you spoke in your last letter, in case of the work not being published shortly, as in this case Cuvier can make use of them by citing them in his 4th vol. which will be of considerable advantage to Mr Young's book. He will do the same for your paper on Yorkshire, copies of the Plates of which I expect daily from Clift.

I have not heard anything of late concerning Leach or his place as the Museum. I have not yet made any application, the reason for which is that Leach is now getting better (apparently); his place to my knowledge is not yet declared Vacant, and the laws of friendship & of delicacy which I owe to Leach do not allow me to apply as yet—as soon as I shall have heard of the Vacancy being declared I shall apply but not until then. To judge after the list of Candidates Great Britain is in a poor state as regards Zoology—your two best candidates (at least those which stand the best chance of succeeding) are foreigners—Mr Harker's¹⁹⁹ application is really ridiculous. Zoology is a very difficult study and if Mr H. judges from Botany he will be wonderfully mistaken—the Zoologist must be anatomist; [word deleted] Botany is what Mineralogy has been in the German school, a science of external characters. I must say I do not flatter myself with strong hopes of success, in a country where personal interest goes farther than personal talent, although you seem to think that the Archbishop will give the place to the person who best deserves it.—All my friends here, and especially Cuvier, look forward however with the strongest hopes, and I must say that no personal motives interest him—this is to my *amour propre* no small flattery and in case of my non success will serve to console me for the time lost in solliciting [*sic*].

Believe me Ever

Most sincerely yours

J. B. Pentland

Jardin du Roi

To
the Rev. Professor Buckland/F.R.S./Corpus College/Oxford

Postmark
March 4 1822

XXX

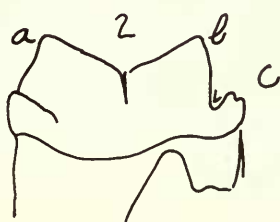
Paris 4 March 1822
Jardin du Roi

My Dear Mr Buckland,

I received yesterday your letters of the 22 & 25 inst,—with the box containing the teeth & album grocum of the Hyaena—for which Cuvier desires me to return you his best thanks.—All those teeth belong decidedly to the Hyaena, something smaller than in that which we have from Gaylenreuth, although belonging evidently to the same species.

I still insist on the presence of a Felis in your Kirkdale Cavern if Clift's drawings be exact—and I am certain that he could not have committed so great an error in two drawings of the same object as to have omitted to mark the talon on the posterior part of the posterior inferior molar, the absence of which in the Cat tribe distinguishes those animals from the Hyaena. I send you a comparative sketch of Clift's (1) drawing and of one of your hyaena's teeth (2). You see that in the genus Felis this tooth consists in two portions a.b. whereas there is a *third* portion or Talon—c., in the Hyaenas—as in the genus Mustela.—Now I repeat there is not a trace of the talon in Clift's drawing—and thus our dispute is reduced to this—whether Clift's drawings are exact or not.

left outside
hyaena's tooth



right outside
tooth of Felis

There is another character which is decisive in the relative proportions of the portions a & b. In the Hyaena the anterior portion a. is considerably larger than the posterior one, in the Felis tribe the posterior b. is the largest.—In fine if Clift's drawings is [*sic*] exact I will answer on *my head*, that the tooth in question is *that of a Felis*.—The discovery of the bear's jaw is wonderfully interesting. To which of the fossil species does it belong?—I am sorry to say that we have not at present a living Cape Hyaena (*Canis Crocuta*)²⁰⁰ and our *Canis Hyaena*²⁰¹ is so very old & Paralytic that we are obliged to feed her on flesh—so that I cannot execute your commission.—In speaking of Hyaenas, perhaps you are aware that Mr Temminck²⁰² has published a paper on what it he calls l'Hyène varié. I have just received the head of this animal from Amsterdam. I find that it ['belongs' deleted] is a species of Dog & not an Hyaena. I intend to give a portion of the Album Grocum to Mr Vauquelin²⁰³ to analyze.—Has Woolaston [*sic*]²⁰⁴ made a quantitative or numerical analysis of this substance?

I enclose you a short instruction that Cuvier desires for you during your Orkney tour. I beg you to send a copy of it to Webb,¹²⁹ as you will find few of the objects ['there' deleted] in yr. tour & as he may meet with the greater number of them.

I am very glad to find that you will have no objection to continue our correspondence, the best plan will be to send your letter to the foreign office to Mr Macleay, who takes care to direct them to me to the care of our Minister at Naples—['Rome' deleted] Florence &c. to Mr Rickett's care. I send you our route, with the last day which I shall remain in each town: I will not promise to be quite as exact as I have been hitherto, however you may depend that I shall do everything in my power. I shall have only besides yourself one correspondent, which is Mr Cuvier's family.—I intend leaving Paris on Thursday 7 of March, but as I intend to stop sometime at Lyons & Geneva, I request you to write to me as usual to Royer's¹⁹¹ care, since my servant will not leave Paris until 8 days after my departure—so that he will bring any letters on, and if you possibly can send me on a few copies of your paper on the Alps—I have 5 of your British Strata which I shall distribute in Italy.—I beg you to let me know if I can procure any thing for you in Italy—I collect nothing for myself. My first attention shall be directed towards Cuvier—whatever else I can collect shall be at my friends' disposition, and you will undoubtedly come under this class.—Write to me at Naples—it is not improbable that we shall visit Sicily and that this excursion will last 3 months, it depends entirely on the tranquil State of the Country.—

I have directed that the remaining part of the Plaster Casts should be sent as soon as finished.—This second collection is still superior in execution to the first one in point of execution [*sic*]. I have sent Clift a copy of the Catalogue, which I have requested him to send you.—Present my best respects to Daubeny⁶² & to Mr Conybeare &

Believe me Ever Most Sincerely
Yours, J. B. Pentland

(See next page for Plan of route)

In going

Mount Cenis
Turin 23 March
Piacenza
Parma
Bologna
Tinola
Rimini
Pesaro
Ancona
Rome *7 April
Naples 7 May

*I shall only stop a few days in Rome in going but shall remain a month on my return

returning

Naples
Rome 10 June
Civita Vecchia
Florence 6 July
Leghorn
Pisa
Lucca
Cavara
Genoa 1 August
Reggio
Mantua
Padua
Venice 1 September
Bassano
Treviso

Vicenza
Verona
Bergamo
Brescia
Milan
Pavia
St. Simpron
Geneva
Neuchatel
Schaffausen [*sic*]²⁰⁵
Oeningen
& perhaps afterwards into Germany if I [deletion] pass the winter on the Continent

[POSTSCRIPT ADDED AT HEAD OF LETTER] I enclose a letter for Webb, whose address I do not know, and beg you to send it to him.

XXXI

Pencil date '19 March 1822'

My Dear Mr Buckland,

At the moment of my departure from this town I received through Mr Cuvier your kind letter of the 4th instant, and am sorry that I have not been able to peruse your most interesting paper on the Yorkshire Caverns,²⁰⁶ it having arrived after my departure from Paris. You may rest assured that Cuvier and Laurillard shall only see it, so that there is no danger of its contents transpiring before its publication. As to your allusions to the bones found in fissures at Nice, Gibraltar &c., I am not of your opinion as to the identity or rather analogy with the Caverns, because in only one instance has an extinct species of animal been found. This animal is the species of *Lagomys* which Mr Cuvier speaks of in his 4th vol., and although those fissures have been most carefully examined in several countries, none of [the] most common remains of the gravel beds have been found—such as Elephant, Rhinoceros, Hippopotamus & horse, not to speak of Bears, Hyaenas &c.

Before leaving Paris, I agreed with Mr Laurillard that he should take up my correspondence with you, so that you will hereafter you [*sic*] will address your letters to him. I fear he will not find time to write as long letters as I have, but he shall always feel most happy in serving you. We have agreed that he should write in French, and that you should write in English which Laurillard understands perfectly.

You speak of a Plaster cast of a bone which you suppose to be of *Ichtyosaurus* which you say you sent last summer. There must be some mistake here as I never received any such specimen—If you have still a cast of it, send it to Laurillard who will determine it as well as I could do.

We leave Lyons this Evg. for Turin. We remain as short a time as possible on the road so as to get to Rome on the first of April, where we shall remain until the first of June. I shall write to you from Rome, when I shall explain to you the future plans of my route. Write to me as often as you can. My address at Rome is aux Loins de M. Chiaveri²⁰⁷ chez le Duc de Tortonie [?]²⁰⁷ à Rome.

Excuse my scrawl, my fellow traveller/is waiting for me in the/carriage, so I must close this/wishing you every happiness Believe me

Your very sincere friend
Joseph Pentland

Lyons 19 March 1822
Hotel de l'Europe

To the
Revd. Wm Buckland F.R.S./Corpus College/Oxford

Postmark
Ap. 5 1822

XXXII This single letter, written to Cuvier by Pentland whilst on his Italian tour in 1822, is in the collections of the Institut de France (Carton 3244, pièce 58). The French text, as transcribed, is first presented without annotation. An English translation (courteously prepared by Dr Jocelyne C. Legault, in association with W.A.S.S.), with annotations, follows.

Privati
Monsieur,

Florence 8 Decembre, 1822
Cafe Gazzeri
Piazza del Carmine

Je vous ai annoncé il y a trois semaines que j'ai réussi de voir les os fossiles du Val d'Arno, que vous attendiez depuis long temps [*sic*], l'absence momentaires de M. Bardi le Directeur du Museum de Florence a retardé l'envoi plus long tems [*sic*] que je croyais—dans ma lettre je vous ai parlé de la cause qui a empêché que M. Nesti fasse l'envoi. Savoir que le Grand Duc n'a voulu rien donner sans savoir ce qu'il recevrait en échange—j'ai vu alors qu'il fallait offrir quelque

chose plus que les plâtres des ossemens qu'on a envoyé afin d'avoir quelques beaux morceaux qui manquent [word missing] ou entièrement à votre Muséum, ou qui sont si inutiles qu'on aurait besoin de les remplacer. J'ai pris la liberté par consequence de fournir une liste de ce que vous pouvez donner au Muséum ici. Je vous l'envoie et j'espère que vous trouverez que je ne suis pas allé trop loin, ou que j'ai promis des choses que vous ne pourriez pas donner—vous verrez que ce sont surtout des oiseaux et quelques quadrupeds [*sic*] du voyage de Lalande principalement, et que vous avez en si grand quantité.

Comme je me suis engagé de votre nom, je vous prie de faire expédier le plutôt possible les objets que vous voulez donner. Le Grand Duc qui prend un très grand interet dans son Muséum les attend avec impatience, et j'espère de pouvoir avoir quelques beaux morceaux d'ossemens, lorsque l'envoi sera arrivé. Comme il ne faut pas long tems [*sic*] pour faire cet envoi, serai-je vous prier de ne le pas laisser trainer, car je craindrais alors qu'on ne réussirait plus d'avoir rien d'ici, et comme il est probable que je reste à Florence envore deux mois, il serait convenable que les objets que j'ai promis arrivassent avant mon depart.

Vous verriez par le Catalogue ci-joint que je vous envoie un squelette presque complete [*sic*] d'Hippopotame. J'ai pris des pièces que je savis que vous aviez déjà, mais il est bon loin de rien refuser. Avec l'exception d'un omoplatte entier, vous aurez une aussi belle série des os de l'Hippopotame que le Musée de Florence. La tête et la machoire intérieur sont les plus complets des trois que j'ai examinés—Quant au Rhinoceros je ne puis pas dire autant. Quoique on a ici les extremités complets, je n'ai pas pu avoir autre chose que les os de l'extremité antérieur, mais je ferai mouler en plâtre l'extremité postérieur.

Je voudrais pouvoir vous dire tout ce qu'on a trouvé le plus remarquable depuis votre voyage en Italie, mais un tel détail outrepasserait les bornes d'une lettre. Au reste je vous le ferai connaître à mon retour—Il y a cependant quelques objets que peut-être vous seriez bien aisé de connaître avant de terminer votre bel ouvrage sur les fossiles. Si vous en voulez des dessins je les ferai faire, mais si vous aimeriez mieux des plâtres, je m'en chargerai moi-même.

Je ne parle pas du squelette presque entier du Mastodon trouvé récemment, comme M. Nesti publiera sous un mémoire la-dessus—ni des trois têtes d'Elephans [*sic*], dont on a trouvé deux dans le mois dernier—je passe aux Carnassiers, dont vous n'avez presque rien.

1. Hyène. M. Targeoni possède un tête entier, mais fort écrasé, et dont les dents manquent en grand parti—mais la forme générale de la tête est bien conservé, et je crois qu'il sera digne de paraître dans votre ouvrage. M. Targeoni a aussi deux portions de la machoire supérieure du même animal, renfermant les trois molaires postérieures—je me propose de faire mouler la meilleure.—Le Muséum de Florence ne possède qu'une machoire inférieure mutilé—mais Canali de Perugia m'a promis de m'envoyer un dessin d'une mieux conservé qu'il possède—Quoique j'ai cherché beaucoup je n'ai pas vu d'autre os de cet animal—excepté un morceau de vertèbre.

2. Ours. Il y a au Muséum un tête presque entier [*sic*] qu'on a apporté récemment de Figline. Un parti de l'occiput est cassé, mais toutes les molaires y sont, ainsi que la machoire inférieure.—La grandeur excède à peinc celle de l'ours noir d'Amérique. Il y a 6 molaires derrière les canines en haut. [Marginal comment: 'Comme dans l'U. longirostrus décrit par Siedemann.'] Les trois premières sont très petites, et remplissent tout l'espace entre les canine et les premiers grosses molaires. Je n'ai pas pu encore examiner la machoire inférieure, étant recouverte de terre. Aussitot que j'aurai le tems [*sic*] je me mettrai de nettoyer le morceau et de le faire dessiner de suite.—Le Muséum possède un autre morceau de machoire renfermant quelques dents. M. Targeoni en a aussi, mais peu important.—Le seul os d'ours que j'ai vu est la portion [deletion] supérieur du fémur, mais trouvé dans une position bien different de ceux du Val d'Arno, savoir ['dans' deleted] avec les Roches osseuses de Pise.—Ce morceau devait appartenir à un très grand individu—je ne puis pas dire avec certitude s'il appartient à un ours ou à un Lion, comme il est en partie enveloppé de Stalactite—mais il n'est pas le moudre [?] dont qu'il ne peut pas provenir d'un Ruminant.

3. Chien. Il parait qu'il y en a de deux grandeurs qui correspond pour la taille du Loup ou du Renard.

4. J'ai trouvé dans le Museum de Targeoni deux dents Canines, qui ne peuvent pas se rapporter à aucun des animaux qu'on trouve dans le Val d'Arno.—Ces Canines sont très longues

et pointues, qu'on prendrait au premier coupe d'oeuill pour appartenir à des Carnassiers mais leur grand applatissement exclu ces derniers.—Le deux diamètres sont dans le rapport de 2/5 à 1.—Je serais tenter [*sic*] de croire que ces dents appartient ce même animal dont vous avez un portion de [deletion] bassin et que vous avez rapproché à des Tapirs. J'en ferai un plâtre.

5. Ruminans [*sic*]. Je vous ai parlé dans un [*sic*] autre lettre d'une belle tête de Boeuf et de bois d'un très grand Cerf du Val d'Arno, qui ne ressemble à rien que j'ai vu; M. Targeoni m'a promis de les faire dessiner.

Je ne sais pas si vous avez examiné des os que Targeoni Tozzetti attribuent au Trichechus rosmarus—et qu'il avait trouvé dans les collines coquillières de Pise—je les crois du Lamaitin [?] mais je ne puis pas prononcer, car ils sont tous couvertes de terre. Il y a un coudre [?] et quelques autres os.—Cependant si vous voulez en avoir des dessins, je demanderai de les découvrir—M. Targeoni vient d'acquérir une machoire inférieur tout entier d'Eléphant de Val d'Arno, de la variété à menton pointu—c'est le morceau le plus complet que j'ai vu de cet animal.

Les Caisses vont partir pour Levouran après demain, pour être embarqué pour Le Havre, s'il aura un bâtiment; autrement on les enverra à Marseille, ou je vous prie de faire prévenir la Commissaire de Marine, afin de les faire plomber. Autrement je suis sur qu'on les casse.—Vous trouverez dans les caisses différents petits paquets signés de mon nom—ce sont des os qu'on m'a donné pour mes Collections, ou qu' j'ai acheté à Figline.

Ayez la bonté de me rappeler au souvenirs de Madame Cuvier, des demoiselles et de Laurillard et de me croire Votre bien Devoué

J. Pentland

Privat No. 2

Hippopotamus

- No. 1. Tête presque 'entier d'Hippopotamus, dont il ne manque que la partie inférieure des os de nez.
2. Machoire inférieure, appartenant à la même tête, dont un des Condyles seulement manque.
3. Omoplatte mutilé, mais qui offre une grande partie du contour.
4. Bassin qui manque les ailes iliaques et une portion du symphysis du Pubis.
5. Atlas.
- 6-7. Deux autres vertèbres cervicales.
8. Un des vertèbres antérieurs de dos.
9. Humerus entière.
10. Radius et Cubitus réunis très entière et du plus grand individu.
- 11-13. Os du Carpe.
14. [Deleted.]
15. Les 4 os du Metacarpes.
16. Fémur
17. Tibia qui correspondent à les seules portions du Fibule que j'ai vu tout dans la collection de Targeoni. Je compte d'en faire mouler un.
18. Rotula.
- 19-21. Os du Tarse. Je ne vous envoie l'Astragale et Calcaneum, comme je sais que vous en avez déjà 2.
22. Les quatre os du metatarse.

Je n'ai pas pu avoir des phalanges, car le Muséum de Florence en possède très peu, et M. Nesti n'a pas encore commencé de les classer—je vous enverrai, je crois dans un autre envoi.

Eléphant

23. Les 3/4 inférieurs du fémur, montrant que l'espace entre les condyles reste toujours ouverte.
- 24-25. Deux molaires.
26. Défense très longue, qui a été brisé en 5 pièces, mais dont les fractures s'adaptent.

Rhinceros

27. Portion de la machoire inférieur renferment 3 molaires entières et les alvéoles des qutres.
28. Molaire supérieur—mutilé.
29. Humerus entier.
30. Radius.
31. Cubitus.
31. [*sic*]. Les deux derniers os réunis.
33. Astragalus. Dans un autre envoi, on peut vous donner quelques os du Carpe et du Metacarpe. Pour le membre postérieur—il y en a rien.

Ruminantia

34. Tête presqu'entier d'un grand Ruminante.
35. Palais avec des dents supérieurs d'une espèce plus petit.
36. Machoire inférieur d'une espèce de la taille d'un Chevreuil.
37. Sept os du metacarpe et du métatarse, montrant qu'il y a au moins 4 espèces différents par les tailles.
38. Humerus d'un Cerf?
- 39-42. Quatre Astragales de diverses grandeurs.
43. Portion mutilé d'un corne de Cerf (3 morceaux).
44. Portion inférieur de Bois de Cerf plus petit.

Cheval

45. Partie de la machoire.
- 46-47. Canons antérieurs et postérieurs.
48. Astragale.
49. Morceau du terrain dans lequel se trouve les os fossiles du Val d'Arno, renferment des Unios et d'autres coquilles d'eau douce.

Florence le 7 Decr 1822.

J. B. Pentland

Les ossemens compris dans le Catalogue ci-joint sont dans 5 caisses que j'ai adressé à M. Eyries de Havre s'il le trouvera un bâtiment à Levouran qui fait voile pour ce port—autrement on les enverra à Marseille ou j'ai prévenu le Commissaire de Marine.

Vous trouverez dans ces caisses des objets qui m'appartiennent, chaque pièce a mon nom écrit dessus.—Ou est envelopper dans un papier sur lequel j'ai aussi écrit. Il y a beaucoup de ces papiers dans la Caisse No. 2. Les autres sont distribués avec les os pour vous.—Je prie M. Cuvier de faire mettre de côté cequi est à moi jusqu'a mon retour à Paris.

J'espère pouvoir vous faire en autre envoie avant de quitter ce pays. Le Gd. Duc paraît fort parti d'être obligéant, et vous pouvez compter sur moi. Seulement je repète que tant cela dépendra sur ce que vous l'enverrez.—et l'expédition qu'on y mettra. J'ai fait la connaissance du Propriétaire des Mines de Charbon de Cadi Bona presso [?] de Savorne—qui m'a promis des os fossiles—je vous les enverrai aussitôt que je les aurai reçu.

J.P.

Privati

Florence 8 December, 1822
Cafe Gazzeri
Piazza de Carmine

Sir,

I announced to you three weeks ago that I had succeeded in seeing the fossil bones of the Val d'Arno, for which you had been waiting for so long; the temporary absence of M. Bardi,²⁰⁸ the Director of the Museum of Florence, delayed the despatch longer than I believed—In my letter

I spoke to you of the reason which prevented M. Nesti²⁰⁹ from sending them. You must know that the Grand Duke²¹⁰ did not want to give anything without knowing what he would receive in exchange—I saw then that one would have to offer something more than the plaster casts of the bones we have sent in order to have some fine pieces which are missing [word missing—perhaps ‘partially’] or entirely from your museum, or which are so useless that they would need to be replaced. I have taken the liberty, in consequence, of providing a list of what you can give to the Museum here. I am sending it to you and I hope that you will find that I did not go too far, or that I have promised things that you could not give—you will see that they are mainly birds and some quadrupeds, mainly from the Lalande²¹¹ voyage, and which you have in such great quantity.

As I am acting in your name, I ask you to send as quickly as possible the objects that you wish to give. The Grand Duke, who takes a very great interest in his Museum, waits for them impatiently, and I hope to be able to obtain some fine specimens of bones, when the shipment has arrived. As it should not take long to make this shipment, dare I ask you to not delay, because I would then fear that we would not succeed in getting anything else from here, and as it is probable that I will stay in Florence two more months, it would be appropriate that the objects which I have promised should arrive before my departure.

You will see from the catalogue here included that I am sending you a nearly complete hippopotamus skeleton. I accepted specimens which I knew you already have, but it is good to refuse nothing. With the exception of a complete shoulder-blade, you will also have as good a series of hippopotamus bones as the Florence Museum. The skull and the lower jaw are the most complete of the three which I examined. As for the rhinoceros, I cannot say as much. Although they have here the complete extremities, I could not obtain more than the bones of the front extremity, but I will have moulded in plaster the posterior extremity.

I wish I were able to tell you all that we have found the most remarkable since your journey in Italy, but such detail would exceed the limits of a letter. For the rest, I will let you know on my return.—There are however some objects which perhaps you would like to hear about before finishing your fine work on the fossils. If you wish for drawings, I will have them made, but if you would prefer plaster casts, I will see to it myself.

I do not speak of the nearly complete skeleton of a Mastodon found recently, since M. Nesti will soon publish a memoir on it²¹²—nor of the three elephant skulls, two of which were found last month—I pass on to the carnivores, of which you have hardly any.

1. Hyena. M. Targeoni²¹³ possesses a complete, but very crushed, skull, whose teeth are largely missing—but the general form of the skull is well preserved, and I believe that it will be worthy of appearing in your work. M. Targeoni also has two portions of the upper jaw of the same animal, containing the three posterior molars—I propose to make moulds of the best.—The Museum of Florence only has a mutilated lower jaw—but Canali²¹⁴ of Perugia has promised to send me a drawing of a better preserved one which he has.—Although I searched a lot I did not see any other bones of this animal—except for a fragment of vertebra.

2. Bear. There is in the Museum an almost complete skull which was recently brought from Figline.²¹⁵ A part of the occiput is broken, but all the molars are there, as well as the lower jaw.—The size scarcely exceeds that of the American black bear. There are six molars behind the canines on the top. [*Marginal insertion*: ‘As in the U[rsus] longirostris described by Siedemann²¹⁶’]. The first three are very small and fill all the space between the canines and the first large molars. I have not yet been able to examine the lower jaw, [it] being covered by earth. As soon as I have the time, I will set myself to cleaning this piece and have it drawn immediately after.²¹⁷—The Museum possesses another piece of a jaw containing several teeth. M. Targeoni also has [one], but less important.—The only bear bone that I saw is the upper portion of the femur, but found in a position very different from those of Val d’Arno, to wit with the osseous rocks of Pisa.—This piece must have belonged to a very large individual—I cannot say with certainty if it belonged to a bear or to a lion, as it is in part enveloped in stalactite,—but it is not the grinding tooth, therefore it cannot come from a ruminant.

3. Dog. It seems that there are two sizes, which correspond in dimensions to a wolf and a fox.

4. I found in Targeoni's Museum two canine teeth, which cannot be related to any of the animals which one finds in the Val d'Arno.—These canines are very long and pointed; one takes them at first sight as belonging to carnivores, but their great flattening excludes the latter. The two diameters are in the ratio of 2/5 to 1.—I would be tempted to believe that these teeth belong to the same animal of which you have a portion of pelvis and which you have related to the Tapirs. I will make a plaster cast.

5. Ruminants. I have spoken in another letter of a fine bull's skull and of antlers of a very large stag from the Val d'Arno, which resembles nothing I have seen. M. Targeoni has promised to make me drawings of them.

I do not know if you have examined the bones that Targeoni Tozzetti attributes to *Trichechus rosmarus*²¹⁸—and which he found in the shelly hills of Pisa.—I believe them to be of Lamaitin [?]²¹⁹ but I cannot pronounce with confidence, because they are all covered with earth. There is an elbow [?] and some other bones.—However if you wish for drawings of them, I will ask to have them uncovered.—M. Targeoni has just acquired a quite complete lower jaw of [an] elephant from Val d'Arno, of the variety with pointed chin—this is the most complete example I have seen of this animal.

The boxes will leave for Levouran²²⁰ the day after tomorrow, to be embarked for Le Havre, if there is a vessel; otherwise we will send them to Marseilles, where I pray you to advise the Commissaire de Marine, in order to have them sealed. Otherwise I am certain that they will be broken.—You will find in the cases various small packages signed with my name—these are the bones which were given to me for my collection, or which I bought from Figline.

Please be good enough to recall me to the recollections of Madame Cuvier, the girls and Laurillard and to believe me your devoted.

J. Pentland

Privat No. 2

Hippopotamus

- No. 1. Almost complete skull, of which only the lower part of the nasal bones are missing.
 2. Lower jaw, belonging to the same head, of which only one of the condyles is missing.
 3. Mutilated shoulder-blade, but which exhibits a large part of the outline.
 4. Pelvis which lacks the iliac wings and a portion of the pubic symphysis.
 5. Atlas.
 - 6–7. Two other cervical vertebrae.
 8. One of the anterior back vertebrae.
 9. Complete humerus.
 10. Radius and cubitus joined together very completely and from a very large individual.
 - 11–13. Carpal bones.
 14. [Deleted.]
 15. The 4 bones of the metacarpus.
 16. Femur.
 17. Tibia. which correspond to the only portions of the fibula which I have seen in the whole collection of Targeoni. I plan to make a mould of one.
 18. Rotula.
 - 19–21. Bones of the tarsus. I do not send the astragalus and the calcaneum, because I know you already have 2.
 22. The four bones of the metatarsus.
- I have not been able to get the phalanges, because the Museum of Florence has very few, and M. Nesti has not yet started to classify them—I will send them, I hope in another shipment.

Elephant

23. The lower 3/4 of the femur, showing that the space between the condyles always remains open.

24-25. Two molars.

26. Very long tusk, which has been broken in 5 pieces, but whose fractures fit.

Rhinoceros

27. Portion of the lower jaw containing 3 complete molars and the alveoli of the others.

28. Upper molar, damaged.

29. Complete humerus.

30. Radius.

31. Cubitus.

31. [*sic*] The two latter bones, united.

33. Astralagalus. In another shipment, we can give you some bones of the carpus and of the metacarpus. For the posterior member—there is nothing.

Ruminantia

34. Almost complete skull of a large ruminant.

35. Palate, with the upper teeth, of a smaller species.

36. Lower jaw of a species of the size of a deer.

37. Seven metacarpal and metatarsal bones, indicating that there are at least 4 different species by their sizes.

38. Humerus of a stag?

39-42. Four astragali of diverse sizes.

43. Damaged portion of the horn of a stag (3 fragments).

44. Lower portion of the antler of a smaller stag.

Horse

45. Section of the jaw.

46-47. Anterior and posterior cannons.

48. Astragalus.

49. Portion of earth in which are found the fossil bones of the Val d'Arno, containing Unios and other freshwater shells.

Florence 7 December, 1822

J. B. Pentland

The bones included in the Catalogue sent herewith are in the 5 boxes which I have addressed to M. Eyries of Le Havre if a vessel is found at Levouran²²⁰ which sails for this port—otherwise they will be sent to Marseilles, where I have advised the Commissaire de Marine.

You will find in these cases objects which belong to me; each piece has my name written on it—or is wrapped in a paper on which I also wrote. There are many of these papers in Box no. 2. The others are distributed with the bones for you.—I pray M. Cuvier to put aside what is mine until my return to Paris.

I hope to be able to send you another shipment before leaving this country. The Grand Duke appears quite inclined to be obliging, and you can count on me. Only I repeat that all this depends on what you will send to him—and the speed with which they are sent. I have made the acquaintance of the Proprietor of the Coal Mines of Cadi Bona presso [?] in Savorne—who has promised fossil bones—I will send them to you as soon as they are received.

J.P.

XXXIII. The last letter of this correspondence is from the collection of the late Dr Victor A. & Mrs Joan M. Eyles, Great Rissington, Gloucestershire. That it is again addressed to Buckland is clear from its contents, though the addressee is not named:

Paris 28 feby 1824
No 98 rue du faubourg du Roule

Dear Sir,

Our friend Cuvier has this moment requested me to write to you on the subject of the paper which you proposed publishing on the Stonesfield reptile the *Megalosaurus*. He is now at that part of his work where he intends speaking of your reptile, and wishes to know if your paper has been yet published—and in what form? And in what work?²²¹ He is also desirous of knowing whether any thing new has appeared on the genera *Ichtyo* & *Plesio*—sauri since he is on the point of publishing his remarks thereon. M. Cuvier sent you the 1st part of his *Ve Vol.* nearly 3 months ago by the Abbé de Rouffigny,²²² he is anxious to be informed if you have received it, he sent at the same [time] copies to Sir E. Home & Mr Clift, who have not acknowledged the receipt of it.

M. Cuvier will send you in a few days by Mr Temmink [*sic*]²⁰² some casts of bones which were found at Honfleur & which he supposes to belong to the *Megalosaurus*; he wishes you to compare them with those in your collection and to give him your opinion on the subject, but he will write to you himself by Mr Temmink [*sic*]²⁰²—and would have done so now had he not been very busily occupied by the Government and the Elections. He is about to commence the History of Fossil fishes. Having arranged and described all the living species of the collection amounting to more than 2,500 species, he will commence the publication as soon as he shall [have] finished his fossil Reptiles which will be in April next.

I expect to be in England in all March; my stay there will be short. From thence I shall return to Italy and pass next winter in Sicily.

We have nothing new in Geology here; all expect anxiously the new edition of your *Reliquiae*²²³—I have a packet of pamphlets to send you, but am waiting for an opportunity, having no longer the permission to send by the Foreign Office. If Mr Temmink [*sic*] will take charge of them I shall desire him to leave them, with the plaster casts from Cuvier, at the Geological Society.

Yours faithfully,
J. B. Pentland

[On back] I have some notion of presenting a very fine collection of fossil bones to one of our Museums. Would they be acceptable to the Geol: Society? or would it be better to offer them to the Brit: Museum?²²⁴

I do not say any thing of the Walruss you intend sending Cuvier, not having received an answer from you on the subject.

The last four letters which we include all date from Pentland's later period of work in Cuvier's laboratory. The first two provide yet another evidence of Pentland's frequent and (it seems) always very willing services as cicerone to visitors to the French capital. His visitor on this occasion was Alexander Turnbull Christie, a Scot who had served as assistant surgeon with the East India Company and had returned to Europe in 1828. For the two years that followed, he was engaged in studying geology, meteorology and other branches of science in Edinburgh and on the Continent. In 1830 he was appointed geological surveyor on the Madras establishment; his letter evidently refers to his endeavours to secure this post. Christie did not return to India until 1831 and died there in 1832; during his short scientific career he contributed a number of papers to the *Edinburgh New Philosophical Journal*.

XXXIV This letter dates from 1830; it is unsigned, but undoubtedly written by Christie. The penultimate paragraph makes it clear that Pentland was again seeking Governmental employment, perhaps in a consular capacity; but it appears that, this time, he was unfortunate.

[1830]

My dear Pentland,

I have herewith the pleasure of sending you your books and papers. I am happy to have this early opportunity of again assuring you that I shall always remember how much I am indebted

to you for your many acts of kindness, and that if I can do anything for you here I hope you will command me.

I called on Sir John Franklin, but he was not at home. I therefore wrote a note to him requesting him to let me know whether he had sent you the books.—I have not yet received his answer.—I shall probably not see him before next Wednesday on which day I am to dine with him.—I will ask Mr Murchison today about the volumes of the Geol. Trans. I delivered your letters to him yesterday, and had [~~received~~] a very kind reception from him.—I am to meet him today at the rooms of the Geological Society.—I have not yet had time to call on Mrs Lee,²²⁵ but shall probably do so tomorrow.

I am sorry to find that there is no meeting of the Geological Society this week.—I therefore intend to remain in town till the end of next week, that I may have an opportunity of seeing Buckland, Sedgwick and the other members before going to Scotland.—I have seen none of my Indian friends yet.—Mr Elphinstone is in town, but was not at home when I called on him.—I understand he says he will do all in his power to serve me, but is very doubtful whether the Court will make the appointment at present, they are persisting so resolutely in their saving [?] system. However I am [twice repeated] not without hopes of success.

My boxes that were dispatched by the roulage accéléré, had not arrived at Calais when I was there! I left directions with Mons. Bignolle to forward them to his agents in London, who will reshipe them for Leith., As M. B. is in the daily habit of executing commissions of this sort I have no doubt they will arrive quite safe.—

XXXV. Pentland's response suggests that he was at this time engaged in final work on his map of Lake Titicaca (see p. 251).

[1830]

Dear Christie,

I enclose a letter wh. [which] I only yesterday received from home in attention of the porter at No. 7.—I also received my last courier the packet of papers you were kind enough to send me, and am now over head & ears in calculations for my map.

I sincerely rejoice that you have found my friends so obliging and I trust you will be no less so with Dr Buckland when you shall have known him. I expect to hear further from you on the subject of your prospects on [two illegible words].

I have received the two volumes of Brocchi,²²⁶ which I shall send you (addressed to the Oriental Club) in a few days, as soon as Cuvier's 5th vol. is out wh. [which] it will early in next week.

I shall feel much obliged by your still attending to my [word illegible] about yr. books, as I wish to have them to send on to my friends in Italy—let me know quickly your outlay on my acct. [account] that I may send you the money—short accts. [accounts], long friends you know.

I am subpoenaed to appear in London as a witness in a law suit on the 30th so I must go—but only for a day—I am sorry you will not be then in town. Do not let this prevent you sending me the Books however—Should you be in town, you will find me probably at Halchets [?] Hotel Piccadilly the 29th or 30th.

We have nothing new here, except a Geol. Socy, wh. [which] is in embryo and promises *fever*²²⁷—I do not intend however to belong to it.

Yours very sincerely,
J. B. Pentland

Your Auvergne Box arrived and was sent on to Calais 4 days after you left Paris.
Paris 19th March.

The final two letters, both addressed to Pentland, are contained in the archives of the University of St Andrews, Scotland (J. D. Forbes papers 1831/26 and 1833/4). Both suggest that Pentland had become an active and well-known figure in the Parisian scientific world of his time. In each instance, the French text is given first and an English translation (again courteously prepared by Dr Jocelyne A. Legault, in consultation with W. A. S. S.) follows, with annotations.

XXXVI This letter, which predates Cuvier's death, is a response by the Société Géographique de France to an offer by Pentland to convey to England the gold medal which that Society had awarded to the distinguished Arctic explorer Sir John Franklin (1786–1847), who was then away in the Mediterranean in command of H.M. frigate *Rainbow*. (It is possible that Pentland may have been related to Sir John or to Lady Franklin!)

Bibliothèque du Roi
Paris le 2 Aout 1831

Monsieur,

Sur la réponse que Lady Franklin a faite à la proposition de se charger de la Médaille d'or de la Société géographique de France pour son mari, je viens de déposer cette médaille au Ministère de la Marine. Cette Dame a dit qu'elle pensait que le Capitaine serait pous flatté de la recevoir par l'intermédiaire du Commandant de la Croisière française. Je n'en suis pas moins très sensible, à l'offre obligeante, Monsieur, et je vous prie d'en agréer l'assurance avec celle de ma considération distinguée.

Jomard.
Membre de l'Institut

To Monsieur
Monsieur Pentland,
Paris

Bibliothèque du Roi
Paris, 2 August 1831

Sir,

Regarding the response which Lady Franklin²²⁸ made to the proposition that she accept the gold medal of the Geographical Society of France for her husband, I have just deposited this medal with the Naval Ministry. This Lady said that she thought that the Captain would be more flattered to receive it through the intermediary of the Commander of the French fleet. I am nonetheless very sensible of your kind offer, Sir, and I pray you to accept the assurance of this as well as my distinguished consideration.

Jomard.²²⁹
Member of the Institut.

To Monsieur Pentland, Paris.

XXXVII This last letter, which postdates Cuvier's death, may well have been written whilst Pentland was still engaged in cataloguing the collection at the Jardin du Roi. Its author was Augustin Pyramus de Candolle (1779–1841), the great Swiss plant taxonomist.

[Pencilled superscription 'De Candolle
of Geneva']

Mon cher Monsieur,

Ce billet vous sera remis par Mr Perrottet voyageur botaniste dont je vous ai parlé lorsque j'ai eu l'avantage de vous voir à Paris; il désire sérieusement aller dans la république de Bolivia et je lui ai fait espérer que vous lui donneriez les directions et renseignements nécessaires pour rendre son voyage utile à la Botanique et à la culture. Je vous aurai bien de l'obligation si vous voulez lui consacrer quelques momen[t]s dans ce but et avec l'activité et la bonne volonté qu'i porte à ce genre d'entreprises je ne doute point qu'il ne fasse fructifier vos bonnes instructions.

Agree je vous prie l'expression de la consideration distingué avec laquelle j'ai l'honneur d'être
votre très dévoué
A. P. de Candolle

23 août 1833
à Monsieur Pentland
rue de l'Université n.22
a Paris

My dear Sir,

This note will be given to you by M. Perrottet,²³⁰ botanical traveller, of whom I spoke to you when I had the opportunity of seeing you in Paris; he seriously desires to travel in the Republic of Bolivia and I allowed him to hope that you would give him the directions and information necessary to make his voyage useful to Botany and culture. I would be very obliged if you wished to devote a few moments to this purpose and with the activity and good faith which he brings to this type of enterprise, I do not doubt that he will bring your good instructions to fruition.

I pray you to accept the expression of the distinguished consideration with which I have the honour of being

your very devoted
A. P. de Candolle

23 August 1833
to Monsieur Pentland
Rue de l'Université n.22
à Paris

Acknowledgements

Particular thanks are expressed to the University of Nottingham, and especially to its Library Committee, for enabling this work to be written by purchasing the long series of letters which form the bulk of those here published and for allowing one of us (W.A.S.S.) to transcribe them. The encouragement and support of Lord Energlyn of Caerphilly, which was crucial in this matter, also merits especial mention, as does the help given by Mrs M. A. Welch, Keeper of the Manuscripts at the University of Nottingham, for furnishing photographs and Xerox copies of these letters.

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Notes

- 1 Jean-Léopold-Nicolas-Frédéric, Baron Cuvier (1769–1832) early adopted the name ‘Georges’ by which he is generally known, as a consequence of the death of his elder brother, Georges-Charles-Henri (1765–1769), in the year of his birth.
- 2 Rather surprisingly, the principal archive of Buckland’s correspondence and papers—the Devon County Record Office, Exeter (Oke Papers)—contains no letters to or from Pentland.
- 3 Though he speaks of his ‘parents’ in one letter (p.285), it is to be presumed that he was referring to his foster-parents, whom we have not succeeded in identifying.
- 4 Thomas Webster (1773–1844), author of several important works on the stratigraphy of southeast England.
- 5 ‘I am at the Garden from 6 AM to 8 PM every day, busy either dissecting or picking out Montmartre bones, at which Cuvier is now working.’ (p. 278).
- 6 Father John MacEney (1796?–1841), principally remembered for his investigations of the caverns of Devonshire.
- 7 Kents Cavern, near Torquay. MacEney was incorrect; the tooth found in this cavern was of a sabretooth (*Machairodus latidens* Owen).
- 8 Cuvier’s earlier name has taxonomic priority, however: this species is still known as the Etruscan Bear (*Ursus etruscus* Cuvier).
- 9 William Henry Fitton (1780–1861), another Irishman who migrated to England, was a distinguished stratigrapher and earliest British geological historian, was at that time President of the Geological Society of London.
- 10 Sir Woodbine Parish (1796–1882), afterwards Consul-General at Buenos Aires, where he collected skeletal remains of the great edentate *Megatherium*, on which Buckland later made extensive studies.
- 11 See note 9.
- 12 See note 132.
- 13 Sir Roderick Impey Murchison (1792–1871), second Director of the Geological Survey of Great Britain, a former soldier who became one of Britain’s greatest geologists.
- 14 James Parkinson (1755–1824), also a surgeon, author of *Organic Remains of a Former World* (3 vols., 1804–1811).
- 15 Sir Thomas Livingstone Mitchell (1792–1855), destined later to become one of the most distinguished Australian explorers.
- 16 Robert Jameson (1774–1825), Professor of Natural History in the University of Edinburgh, renowned as Britain’s leading exponent of Wernerian theories of the origin of rocks and minerals.
- 17 Charles Lyell (1797–1875), one of the greatest of all stratigraphers and author of the *Principles of Geology* (1830–33, 3 v.) which established the general applicability of uniformitarian concepts.
- 18 Christian Erich Hermann von Meyer (1801–1869), of Frankfurt-am-Main, who was effectively the founder of vertebrate palaeontology in Germany.
- 19 Pentland’s geographical work in Bolivia is currently under study by Sr. Jack Aiken-Soux, Av. Villazon 240, Casilla 58, Potósi, Bolivia.
- 20 Sir Archibald Geikie (1835–1924), distinguished geologist and scientific historian, fourth Director General of the Geological Survey of Great Britain and President of the Royal Society 1908–1913.
- 21 Hugh Falconer (1808–1865) is especially remembered for his pioneer studies of the fossil vertebrate fauna of India.
- 22 Robert Edmond Grant, F.R.S., (1793–1874) lectured in palaeontology at University College London and was a spirited participant in a number of palaeontological controversies.
- 23 William Willoughby, 3rd Earl of Enniskillen (1807–1886), a collector of fossils, especially fossil fishes.

- 24 Sir Philip de Malpas Grey Egerton (1806–1881), a close friend of the Earl of Enniskillen and also a fossil collector, undertook pioneer researches on vertebrate remains and fossil footprints in the west Midlands of England.
- 25 George Bellas Greenough (1778–1855), one of the founders of the Geological Society of London, who produced one of the earliest geological maps of England and Wales.
- 26 George William Featherstonhaugh, F.R.S. (1780–1866) undertook pioneer geological researches during travels in the United States and subsequently entered the British diplomatic service.
- 27 Sir Andrew Crombie Ramsay (1814–1891), who succeeded Murchison as Director of the Geological Survey.
- 28 Then the residence of Thomas Atherton Powys, third Baron Lilford (1801–1861).
- 29 This manorhouse, rebuilt by George Vivian in 1819, is now a museum of American domestic life.
- 30 He collaborated with James Fergusson (1808–1886) in the writing of *Sketches of the Antiquities of Cusco* (18??) and provided data on South America for Mrs Somerville's *Physical Geography* (London (Murray), 1848. 5th ed. 1862).
- 31 The fact that Pentland was permitted to work in Cuvier's private laboratory and library and to consult his portfolios (p. 273) is a strong indication of the regard in which Cuvier held him.
- 32 Pentland notes (p. 291) that Cuvier had put him in charge of casting.
- 33 Sir Stamford Raffles (1781–1826), great British colonizer and founder of Singapore; an enthusiastic naturalist, responsible for the discovery of many animal and plant species.
- 34 Herbert Wendt, in his book *Out of Noah's Ark* (London: Weidenfeld & Nicholson, 1959. XII, 464 pp.) suggests that this was a consequence of Cuvier's having anticipated Raffles by publishing the first description of the Malayan tapir on the basis of a letter from Diard; but Wendt's account is certainly not to be relied upon, for he describes Diard 'as an experienced animal collector with a knowledge of the Tropics' and suggests that Duvaucel had already smuggled out a major shipment of specimens for Cuvier in Paris, which (as Pentland's letters evidence) was certainly not the case.
- 35 The principal source for these details is R. Amat (Director), *Dictionnaire de biographie française* (Paris: Letourzey et Ané, 1970, 12 volumes to date). The entry for Duvaucel (vol. 12, p. 1010) notes 'Fort dépité, Duvaucel revint seul à Calcutta', but the Diard entry (vol. 11, pp. 252–3) does not make clear his movements between February 1819 and 1821, so that Wendt (1959 see note 34) may be correct in saying that Diard was jailed for two years in Java, for suspected espionage, by the Dutch authorities. However, Wendt's statement that this was a further consequence of Raffles' anger over the tapir incident can surely be discounted!
- 36 The suggestion in one of Pentland's letters (p. 286) that the *original* collection was being sent to Paris is surely misleading; it is evident, however, that Duvaucel had contrived to retain *a part* of his first Sumatran collection and had supplemented it by subsequent collecting.
- 37 Sir Henry Thomas Delabeche [also frequently written De la Beche] (1796–1855), distinguished geologist and first Director of the Geological Survey of Great Britain.
- 38 Presumably of Lower Liassic ichthyosaurs, since the letter subsequently deals with such remains from Dorset.
- 39 Pentland's observations on the osteology of ichthyosaurs and its interpretation are consistently highly perceptive; they are discussed in Delair and Sarjeant (1976).
- 40 The Common Porpoise, *Phocaena phocaena* (Linnaeus).
- 41 Charles Laurillard (1783–1853) joined Cuvier as draughtsman and secretary in 1804 and worked with him for 30 years, becoming his devoted friend and accompanying him on two visits to Italy and on visits to Germany and England. 'For the history of science, the name of Laurillard is inseparable from that of Cuvier' (G.-L. Duvernoy, transl.). Mentioned in many of Pentland's letters.
- 42 Colonel J. (T.) Birch (c. 1768–1829) (see H. S. Torrens: Geological Curators Group Newsletter, vol. 2, no. 7, 1979, pp. 405–412), the earliest important collector of the Liassic saurians of Lyme Regis, Dorset. His collection was sold at auction in the Egyptian Hall, Piccadilly, on 15 May 1820. (The British Museum also purchased some of his fossils).

- 43 William Elford Leach (1780–1836) became Assistant Keeper of the Natural History Department of the British Museum in 1816 and retired as a result of ill-health, brought on by overwork, in 1822. His illness, and the question of appointment of a successor, is treated at length in later letters.
- 44 William Clift (1775–1849), a Cornishman who had worked as assistant to the distinguished surgeon and collector John Hunter (1728–1793), was at this time Curator of the Museum of the Royal College of Surgeons of London.
- 45 The chamaeleon (*Chamaeleon*).
- 46 Now *Gavialis gangeticus*.
- 47 Sir Everard Home, F.R.S. (1756–1832), brother-in-law of John Hunter and himself a surgeon of catholic interests, was the author of a number of papers on fossil vertebrates.
- 48 ‘On the mode of formation of the canal for containing the spinal marrow, and on the form of the fins (if they deserve that name) or the Proteosaurus.’ *Phil. Trans. Roy. Soc., Lond.* **110**, 1820: 159–164, pl.xvi.
- 49 Subsequently named *Plesiosaurus*; see H. T. De la Beche and W. D. Conybeare, ‘Notice of the Discovery of a new fossil Animal, forming a link between the Ichthyosaurus and the Crocodile, together with general remarks on the osteology of the Ichthyosaurus’, *Trans. geol. Soc. Lond.* **5**, 1821: 559–594. The influence of Pentland on the early studies of this second reptile is treated in Delair and Sarjeant (1976).
- 50 William Daniel Conybeare (1787–1857).
- 51 May be William Daniel Conybeare or Georges Cuvier; the French form suggests the latter.
- 52 See note 47.
- 53 The Royal Society, London, which was founded in 1660.
- 54 At about this time, rhinoceros fossils were found at Lawford, near Rugby, Warwickshire; Buckland was concerned in this discovery and may well have undertaken to send one of the skulls to Cuvier. (See W. Buckland, 1823, pp. 26, 27).
- 55 Undoubtedly the *Megalosaurus*. Buckland had found these bones before Cuvier’s visit to Oxford in 1818, since Cuvier had seen and drawn them during his visit (*Ossemens fossiles*, vol.V, 1824, p.2); this ranks as the earliest definite discovery of dinosaur bones by any scientist, amply predating the finding of the tooth of *Iguanodon* by Mantell’s wife in March, 1822, which has often been considered to have occurred at the same time as, or earlier than, the discovery of *Megelesaurus*. For discussion see J. B. Delair and W. A. S. Sarjeant (1975).
- 56 Alexandre Brongniart (1770–1847), Cuvier’s colleague and close friend, was Professor of Mineralogy at the Musée d’Histoire Naturelle. His own work was primarily on invertebrates and in particular on trilobites, but he collaborated with Cuvier on joint researches on the geology of the Seine basin which were to prove of fundamental importance in Cretaceous and Tertiary stratigraphy.
- 57 Charles Stokes (1783–1853), member of the Stock Exchange and collector of almost everything, fossils included; an early member of the Geological Society of London.
- 58 Presumably Nicolas Desmarest (1725–1815), a major French geologist especially famous for his work on the history of the Auvergne; but, if so, his contribution to the work was posthumous.
- 59 Leopold von Buch (1774–1853), the great German geologist.
- 60 Not identified.
- 61 Thomas Richard Underwood (c. 1765–1836), English landscape painter and scientific dilettante.
- 62 Charles Giles Bridle Daubeny (1795–1867), chemist and geologist, Professor of Botany at Oxford from 1834; remembered especially for his work on volcanoes.
- 63 The *Memoirs of the Wernerian Natural History Society*, published in Edinburgh, consistently affirmed Jameson’s belief in the marine origin of basalts; this theory was at this time tottering towards oblivion and Daubeny’s work was helping to undermine it.
- 64 Baron Ernst von Schlotheim (1764–1832), the distinguished German palaeontologist.
- 65 *Petrefaktenkunde* (1820).
- 66 See *Isis*, Jena, Vol. 6, pt. 6, 1820, unnumbered preliminary page.

- 67 A volcano in Peru. Cuvier described the molar of a mammoth from this mountain, found and given to him by Humboldt.
- 68 The Mammoth (*Mammuthus primigenius* Blumenbach), whose frozen remains were known to occur in the banks of the Lena River, Siberia.
- 69 The straight-tusked mastodont.
- 70 The Cave Lion (*Felis leo spelaea*).
- 71 The Cave Hyena (*Crocota crocota spelaea*).
- 72 Francois Sulpice Beudant (1787–1850), French mineralogist and palaeontologist.
- 73 Pentland's awareness that intergradations exist between mica-schist and granite or gneiss is especially noteworthy at this early date. Although James Hutton (1726–1797) had already sketched out the concept of metamorphism, it was as yet neither comprehended nor widely accepted.
- 74 Presumably George Francis Lyon (1795–1832), naval captain and traveller, whose *Narrative of Travels in North Africa in the Years 1818, 1819 and 1820, accompanied by Geographical Notes of the Soudan and the Course of the Niger* was published about this time.
- 75 Not identified.
- 76 The 'Elegy Intended for Professor Buckland', written by Richard Whately on 1 December, 1820: quoted in full in Mrs Gordon's *Life and Correspondence of William Buckland* (London (Murray) 1894, pp.41–2) and since featured in many anthologies of humorous verse.
- 77 Samuel Stevens, English collector of British lepidoptera and coleoptera : brother of natural history auctioneer J. C. Stevens of King Street, Covent Garden, London and later serving as agent for Alfred Russel Wallace and other naturalists in their sales of natural history specimens, especially birds.
- 78 Friedrich Wilhelm Heinrich Alexander von Humboldt (1769–1859), the great German polymath and traveller, who resided frequently in Paris during this period.
- 79 *Personal Narrative of travels to the Equinoxial Regions of the New Continent during the years 1799–1804* (English translation by Helen M. Williams, 5 vols., published in 1824).
- 80 Probably his *Cours élémentaire d'histoire naturelle*. 1st edition. (Paris, 1841).
- 81 Perhaps Aylmer Bourke Lambert (1761–1842) of St Mary Hall, a founder member of the Linnean Society of London.
- 82 Presumably "rhinoceros' head and ichthyosaurus' head" is meant.
- 83 Hans Conrad Escher von der Linth (1767–1823), distinguished Swiss geologist and father of the even more renowned geologist Arnold Escher von der Linth (1807–1872).
- 84 André-Jean-Marie Brochant de Villiers (1772–1840), Professor of Mineralogy at the École des Mines, Paris.
- 85 John Henry Heuland (1778–1856), fashionable London dealer in mineral specimens and himself a notable mineralogist, was Foreign Secretary of the Geological Society of London from 1818 to 1828.
- 86 Sir Joseph Banks (1743–1820), President of the Royal Society for 40 years, and patron of science.
- 87 'Eloge historique de Sir Banks, lu le 2 Avril 1821', in *Recueil des Eloges historiques de l'Institut de France par G. Cuvier*, vol.2, pp.199–230.
- 88 William Phillips (1773–1828), founder member of the Geological Society of London and author of *A selection of Facts from the best Authorities, so arranged as to form an Outline of the Geology of England and Wales* (1818), to which Pentland is here referring.
- 89 Cordier was elected to membership of the Geological Society during 1821.
- 90 William Sharp MacLeay (1792–1865), a co-founder of the 'Zoological Club' which flourished briefly in England around this time; eldest son of Alexander MacLeay, who was Secretary of the Linnean Society of London and founder of the Linnean Society of New South Wales.
- 91 G. A. Mantell's *The Fossils of the South Downs* was not published until 1822; the prospectus must have been issued, therefore, amply in advance of publication.
- 92 René-Just Haüy (1743–1822), distinguished French mineralogist and crystallographer, under whom Pentland had studied (see p. 272).
- 93 Perhaps the engineer Louis-Antoine Beaunier (1779–1835), who was undertaking metallurgical researches in the years 1819–1823 and may well have travelled to London.

- 94 John Kidd (1775–1851), Professor of Chemistry at Oxford from 1805 to 1810 and thereafter continuing to work privately on chemistry till his death.
- 95 Sir William Parry, F.R.S. (1790–1855), Arctic explorer who had recently been in command of the *Hecla* in an attempt on the Northwest Passage, succeeding in penetrating as far as Melville Island, and who left in May 1821 on a second unsuccessful attempt at the Passage. Later (1827) Parry led an expedition from Spitzbergen towards the North Pole which attained to 82° 45' north; this remained 'farthest north' for over 50 years thereafter. A most appropriate person from whom to request the skull of a musk-ox!
- 96 'On the Structure of the Alps, and their relation to the Secondary and Transition Rocks of England'. *Ann. Phil.* (N.S.) 1, 1821: 450–468.
- 97 Mary Morland, eldest daughter of Benjamin Morland of Sheepstead House, near Abingdon, Berkshire. It is said that Buckland met her when travelling by coach in Dorset and entered conversation with her because they were both reading the same volume by Cuvier: Buckland then exclaimed 'You must be Miss Morland, to whom I am about to deliver a letter of introduction!' (see Mrs Gordon, *The life and correspondence of William Buckland, D. D., F.R.S.* (London: Murray 1894, p.91)). They were married on 31 December 1825, their strong common interest in fossils no doubt facilitating both courtship and subsequent life together!
- 98 Louis-Joseph Gay-Lussac (1778–1850), distinguished chemist, remembered especially for his studies of the expansion of gases.
- 99 Not identified.
- 100 Louis-Jacques Thénard (1777–1857), a colleague of Gay-Lussac in the chemical laboratory of the Ecole Polytechnique, Paris; discoverer of hydrogen and associated with Gay-Lussac in the discovery of boron. Made a baron in 1824, a peer of France in 1833, and eventually Chancellor of the University of Paris.
- 101 Louis-Antoine Cordier (1777–1862) began as a mining engineer; participated, under Déodat-Guy-S. Tancredè de Dolomieu (1750–1801), in Napoleon's scientific corps on the Egyptian expedition; worked at the École des Mines for a while and was in 1819 appointed Professor of Geology at the Jardin des Plantes.
- 102 Francis Rawdon, First Marquis of Hastings (1754–1826) [whose earlier title was Earl of Moira], Governor-General of Bengal from 1812 to 1821.
- 103 Presumably again from Warwickshire.
- 104 Georges Cuvier.
- 105 William Daniel Conybeare.
- 106 Presumably for family reasons: see p. 249.
- 107 This was maintained by the Royal College of Surgeons and, although badly bombed in the Second World War, still survives.
- 108 'Description of the Quartz Rock of the Lickey Hill in Worcestershire, and of the Strata immediately surrounding it.' *Trans. geol. Soc. Lond.* 5, 1821: 506–544.
- 109 H. T. De la Beche and W. D. Conybeare, 'Notice of the discovery of a new fossil animal [*Plesiosaurus*] forming a link between the *Ichthyosaurus* and crocodile, together with general remarks on the osteology of the *Ichthyosaurus*.' *Trans. geol. Soc. Lond.* 5, 1821: 559–594. The discussion which follows concerns *Ichthyosaurus*.
- 110 William Daniel Conybeare.
- 111 Northern, or Steller's Sea Lion (now *Eumetopias jubatus* [Schreber]).
- 112 Northern, or Alaska Fur Seal (now *Callorhinus ursinus* [Linn.])'
- 113 Henry, 3rd Earl of Bathurst (1762–1834), distinguished politician. Secretary for War in Lord Liverpool's government and friend of the Duke of Wellington. Presented a collection of stuffed animals from Madagascar to the Bristol Philosophical and Literary Society in 1825.
- 114 Conybeare then lived at Brislington, Somerset, a few miles southwest of Bristol.
- 115 Not identified.
- 116 John Wilson Croker (1780–1857), politician and essayist; then M.P. for Bodmin (1820–26). Friend of Peel.
- 117 Charles Ricketts, who may have been a son of George William Ricketts and brother of the distinguished Indian civil servant Sir Henry Ricketts (1802–1886).

- 118 William Daniel Conybeare.
- 119 'On the peculiarities which distinguish the Manatee of the West Indies from the Dugong of the East Indian seas.' *Phil. Trans. Roy. Soc. Lond.* **111**, 1821: 390–391.
- 120 *A critical examination of the first principles of Geology*. (London: Longman) 1819.
- 121 Switzerland.
- 122 See note 96.
- 123 Adolphe Brongniart (1801–1876), son of Alexandre, destined to become the greatest figure in palaeobotany in the nineteenth century.
- 124 Deer.
- 125 Constant Prévost (1787–1856), later a founder of the Société Géologique de France and three times its President, principally remembered for his theories in dynamic geology, who published at this time the first account of the geology of the Vienna basin. Prévost was later to secure a skeleton of *Plesiosaurus dolichocheirus* from Mary Anning of Lyme Regis, for the Musée d'Histoire Naturelle in Paris: the specimen was figures in Cuvier's *Ossemens fossiles*, 1836 edition, *Atlas*, pl. 3.
- 126 Anselme Gaétan Desmarest (1784–1838), French naturalist and lexicographer. The note referred to may be his entry on 'Trilobites' in the *Nouveau Dictionnaire d'Histoire Naturelle*, second edn., vol. THE-TSU, pp. 449–50.
- 127 Frederick William Hope (1797–1862), author of some 60 papers on entomology and President of the Entomological Society in 1835 and 1846.
- 128 Davies Giddy [afterwards Gilbert] (1767–1839), an early member of the Geological Society of London and first President of the Royal Geological Society of Cornwall. The first alternative cited by Pentland was correct, since Giddy changed his name (doubtless for reasons of respectability) in 1817!
- 129 Philip Barker Webb (1793–1854), a botanist who became interested in geology through Buckland's teaching and who was to be Secretary to the Geological Society of London in 1824–25.
- 130 Not identified.
- 131 Revd. Prof. John Stevens Henslow (1796–1861), an all-round naturalist who was shortly afterwards (1823) appointed Professor of Mineralogy at Oxford, holding this post till 1827, when he became Professor of Botany. Remembered especially for his friendship with, and influence on, Charles Darwin.
- 132 Adam Sedgwick (1785–1873), appointed Woodwardian Professor of Geology at Cambridge in 1818 on the basis of no experience whatsoever, was nonetheless destined to become one of the greatest nineteenth-century geologists.
- 133 Sedgwick's two earliest publications both concerned Cornwall. The one most likely to have reached Pentland at this date is 'On the Physical Structure of those formations which are immediately associated with the Primitive Ridge of Devon and Cornwall', *Trans. phil. Soc. Camb.* **1** 1820: 89–146.
- 134 But compare Pentland's earlier comment, inadequately deleted, in his letter of 21 June 1821 (p. 278)!
- 135 William Daniel Conybeare.
- 136 George Brettingham Sowerby (1788–1854), son of the famous naturalist James Sowerby (1757–1822) and author of 'On the geological formations of Headon Hill in the Isle of Wight', *Ann. Phil.* (N.S.) **2** 1821: 216–220, in which Webster's ideas are sharply criticised.
- 137 For a discussion of this matter, and of Underwood's role in it, see J. Challinor, 'Some correspondence of Thomas Webster, geologist (1773–1844) – – I'. *Ann. Sci.* **17**, 1961: 175–195.
- 138 Georges Cuvier.
- 139 Alfred Duvaucel: see notes 34–36.
- 140 Duvaucel and Diard.
- 141 See note 102. The Marquis of Hastings had in fact already resigned his appointment as Governor-General of Bengal (though he did not in fact leave India till January 1823), so that it is questionable whether he could have been of any service to Pentland.
- 142 Selina Frances Rawdon (1759–1827) became by marriage Countess of Granard.

- 143** Robert Brown (1773–1858), naturalist on Capt. Mathew Flinder's expedition to Australia in 1801–5, librarian to Sir Joseph Banks and Keeper of Botany at the British Museum (1827–1858).
- 144** Jacques-Julian-Houtou de Labillardière (1755–1834), botanist on D'Entrecasteaux' expedition in search of La Pérouse. Author of *Novae hollandiae plantarum specimen* (published in 27 parts, 1804–1807).
- 145** Paul Gaimard (1790–1858), naturalist on the Freycinet expedition of 1818–1820.
- 146** Thomas Pennant (1726–1798), distinguished English naturalist and traveller.
- 147** George Shaw (1751–1813) of Magdalen Hall, a founder member of the Linnean Society of London. Assistant Keeper of the Natural History Department of the British Museum, 1791–1807, Keeper from 1807 till his death. (See also p. 290).
- 148** John Latham (1740–1837), ornithologist; author of *A General Synopsis of Birds* (3 vols., 1781–5), *Index Ornithologicus sine Systema Ornithologiae* (2 vols., 1790) and of other major works published after the date of this letter.
- 149** Sir Humphry Davy was at this time President of the Royal Society, to which office he had succeeded on the death of Banks.
- 150** Karl Dietrich Eberhart König [later known as Charles König] (1774–1851) succeeded Shaw as Assistant Keeper of Natural History at the British Museum and as Keeper on the latter's death in 1813. In 1837, when his office was divided, he became Keeper of the Mineralogical and Geological Branch, which appointment he held till his death.
- 151** Possibly Louis-Etienne-Francois Héricart, Vicomte de Thury (1776–1854), French anatomist, historian and geologist.
- 152** From Kirkdale Cave, near Kirby Moorside, northeast Yorkshire. Buckland first visited this cave on 26 November 1821 (see P. J. Boylan, 'Dean William Buckland 1784–1856. A pioneer in Cave Science.' *Studies in Speleology* 1 1967: 237–253). The first published account of the cave was Rev. G. Young 'On the fossil remains of quadrupeds, &c., discovered in the Cavern of Kirkdale . . . *Mem. Wernerian nat. Hist. Soc.* 4 1822: 262–270. Buckland himself addressed the Royal Society on the Kirkdale discoveries in February 1822 (see *Phil. Trans. R. Soc., Lond.* 122: 171–236) and conducted Sir Humphry Davy on a visit to this cavern and nearby caves in July 1822.
- 153** Name not traced; perhaps an unpublished manuscript name formulated by Cuvier, probably for the Woolly Rhinoceros (*Coelodonta antiquitatis*), which Cuvier called *Rhinoceros tichorhinus*.
- 154** The Sumatran Rhinoceros (*Didermocerus sumatrensis*).
- 155** The Wolverine or Glutton (*Gulogula*).
- 156** Buckland visited these German caves in the summer of 1882 (See Boylan, note 152, 1967, p. 242).
- 157** Johann Christian Rosenmüller (1771–1820), anatomist at Leipzig and author of *De Ossibus fossilibus animalis* (1799).
- 158** A puzzling comment, since according to his obituary notices Pentland had been early left an orphan. Foster-parents, perhaps?
- 159** Granville Levenson-Gower, first Earl Granville (1773–1846), diplomat and intimate friend of Canning.
- 160** This letter is not among Davy's surviving correspondence, nor is a copy of it among Cuvier's surviving letters.
- 161** John Frederick Müller or Miller, son of a distinguished German draughtsman, Johann Sebastian Müller [also known as John Miller] (1715?–1790?), who settled in England in 1744. His son also worked for a while as a draughtsman, accompanying in this capacity Banks and Solander when they visited Iceland in 1773, and later published a series of notes on natural history.
- 162** Thomas Horsfield (1773–1859), an American who worked under Raffles' direction on the natural history of Java and was, from 1820 until his death, Keeper of the Museum of the Honorable East India Company. Worked especially on birds.
- 163** Alcide Dessalines d'Orbigny (1802–1857), zoologist and palaeontologist, destined to become one of the most distinguished stratigraphers of the 19th Century; he formulated the concepts of zones and stages in international stratigraphic correlation.

- 164 Not identified.
- 165 Buckland was elected in 1821 Corresponding Member of the Muséum d'Historie Naturelle au Jardin du Roi.
- 166 J. S. Miller's *Natural History of the Crinoidea* (Bristol, 1821).
- 167 Correctly *Gryphaea arcuata* Lamarck (of which *G. incurva* J. Sowerby is an invalid junior synonym).
- 168 Jean-Baptiste-Pierre-Antoine de Monet, Chevalier de Lamarck (1744–1829), Professor of Zoology at the Jardin du Roi and thus a colleague of Cuvier; famed for his 'transformist' evolutionary theory and for his work on the classification of living and fossil invertebrates.
- 169 One of twelve species of this genus distinguished by Lamarck in his *Histoire naturelle des animaux sans vertébrés* (1819).
- 170 From 1753 to 1963, the British Museum was governed by a Board of Trustees, headed by three Principal Trustees—the Archbishop of Canterbury, the Lord Chancellor, and the Speaker of the House of Commons. The Archbishop was the most senior of the three Principal Trustees and Pentland's memorial would thus have been addressed to him.
- 171 His Grace the Archbishop of Canterbury.
- 172 Presumably Pentland meant that Home's work was deteriorating; there were no events in Home's life at this time to account for any other interpretation, nor was there any cessation in the flow of papers from his pen.
- 173 William Swainson (1789–1855) travelled and collected in South America before 1820; on return, he unsuccessfully sought appointment at the British Museum and, after failing to gain it, became a prolific author of zoological works for Longman, Orme, Brown & Co. Emigrated to New Zealand in 1835 and died there. Notorious for his formulation of the "Circular Classification" of animals.
- 174 See note 77. "Stevens was Treasurer of the Entomological Society—a most active collector, but known as an author only of notes in *The Zoologist and Entom. Soc. Tr.*" (*An Accentuated List of the British Lepidoptera*, 1858.)
- 175 See note 147. For a description of the British Museum collections in Shaw's time, see J. M. Sweet 'Robert Jameson in London, 1793', *Ann. Sci.* 19 1963: 81–116.
- 176 Peter Simon Pallas (1741–1811), German naturalist who travelled extensively in eastern Russia and Siberia and who published vast volumes of observations in geography, geology, botany, zoology and ethnography.
- 177 This paragraph, and especially its last sentence, assuredly destroyed beyond redemption any remaining hope Pentland may have had of Buckland's support. As it transpired, however, none of the candidates named in these letters succeeded to the vacancy left by Leach's retirement. The appointment was not filled till 1823, when John George Children (1777–1852) was transferred to this post from the Dept. of Antiquities—doubtless to the profound dismay of Pentland, Buckland *et al.*! When the Keepership was divided in 1837, Children was promoted to be Keeper of the Zoological Branch, retiring from this post in 1840.
- 178 Transl. 'he is, of all those I know, the one who possesses best the principal branches of zoology.'
- 179 Transl. 'is an almost sure means of your catching up in a field in which we have hitherto surpassed you.'
- 180 Perhaps the drawing of the Honfleur crocodile bones, requested in Pentland's earlier letter (p. 283).
- 181 Buckland's reply had clearly brought home to Pentland the tactlessness of his earlier letter (see note 177).
- 182 P. J. Boyland, in his account of Buckland's work at Kirkdale (note 152), noted that Buckland had been working at Kirkdale Cave in December 1821 and presumed that the visit begun on 26 November had lasted more than a week. Pentland's letter makes it clear, however, that Buckland paid a *second* visit to the cave within a month of his first, which must have been brief.
- 183 'On Mr Conybeare's behalf' is intended.
- 184 Presumably a reference to Buckland's projected visit to Yorkshire.
- 185 Robert Banks Jenkinson, 2nd Earl of Liverpool (1770–1848) was Prime Minister from 1812 to 1827 and also served as Leader of the House of Lords.

186 Charles Ricketts: see note 117.

187 Sir Walter Calverley Trevelyan, F.G.S. (1797–1879), a keen naturalist who had brought Buckland fossil plants from his father's property near Newbiggin, Northumberland, in 1815. Trevelyan went to the Faeroes in 1821, but not to Spitzbergen. Webb, although a great traveller, does not seem to have accompanied him or, indeed, to have ever travelled in northern seas.

188 Piacenza.

189 *Histoire naturelle des Crustacées fossiles sur les rapports zoologiques et géologiques, savoir les Trilobites*. Paris, 1822.

190 Not further identified.

191 Probably Royer-Collard; of a notable French family of savants. The most probable are either Pierre-Paul Royer-Collard (1763–1845), distinguished French philosopher, or his brother's son Hippolyte-Louis Royer-Collard (1802–1850), who became a doctor of medicine but may have taken anatomy courses from Cuvier and worked for him.

192 *Mémoires sur les Animaux sans vertèbres* (1816) by Marie-Jules-César Savigny (1777–1851), a French naturalist who ultimately went blind through too much microscope work.

193 Not identified.

194 The Woolly Rhinoceros, *Coelodonta antiquitatis* Blumenbach (\equiv *Rhinoceros tichorhinus* Cuvier).

195 This jaw, referred by Cuvier (*Ossemens fossiles*, 1824, vol. 5, p. 349) to *Didelphys*, was found in the Great Oolite at Stonesfield. It was later used as holotype for the species *Amphitherium prevosti* Owen.

196 Probably the jaws of the marine reptile found at Market Rasen, lodged in the collections of Oxford University Museum (present catalogue nos. J.9245 a–b), to which Conybeare assigned the name *Plesiosaurus giganteus* (*Trans. geol. Soc. Lond.*, (2) 1 1824: 389) without giving any definition, and which subsequently became the type of *Pliosaurus brachydeirus* Owen (*Rep. Br. Ass. Advmt. Sci.* 1841 1842: 61).

197 The Rev. George Young (1777–1848), a Scot who was for 42 years pastor of Cliff Lane Chapel, Whitby, Yorks. and published extensive studies on the geology and history of Yorkshire.

198 G. Young and J. Bird, 1822, *A geological survey of the Yorkshire coast*. (Whitby; Clark) iv + 236pp., which contained 17 hand-coloured plates.

199 Not identified.

200 The Spotted Hyena (*Crocuta crocuta*).

201 The Striped Hyena (*Hyaena hyaena*).

202 Conrad Jacob Temminck (1778–1857), Dutch ornithologist, Curator of the Royal Museum at Leiden, Netherlands, and later the employer of Diard.

203 Louis-Nicolas Vauquelin (1763–1829), distinguished French chemist and mineralogist; the discoverer of chromium and boron.

204 William Hyde Wollaston (1766–1828), distinguished British scientific polymath: pioneer of the study of powder metallurgy.

205 Schaffhausen.

206 'Account of an Assemblage of Fossil Teeth and Bones of elephant, rhinoceros, hippopotamus, bear, tiger, hyena and sixteen other animals, discovered in a cave at Kirkdale, Yorkshire, in the year 1821'. *Phil. Trans. Roy. Soc., Lond.*, 122 1822: 171–236. For a modern assessment of Buckland's studies of cave fauna, see P. J. Boylan, 1967 (note 152).

207 Neither of these gentlemen has been identified.

208 Not further identified.

209 Filippo Nesti (dates uncertain), then one of Italy's leading palaeontologists, who had written a series of papers on the mammalian fossils of the Val d'Arno.

210 Of Tuscany.

211 Joseph-Jérôme le Français de Lalande (1732–1807), distinguished French astronomer, whose *Voyages d'un Français en Italie en 1765–66* (Venice and Paris, 1769, 8 vols. in 12 atlas) includes a volume on natural history.

212 See *Nuovo Giorn. Letterati*, vol.11, *Parte Sci.*, pp. 195–216; the mastodon fossil is figured in his pl. i.

- 213** Giovanni Targioni-Tozzetti (1712–1783), naturalist of Tuscany especially interested in fossil elephants.
- 214** Luigi Canali, then Curator of the Museum at Perugia, who had written an account of Italian fossil elephants in 1810.
- 215** Figline Valdarno, some 10–11 miles S.E. of Florence in the upper Arno Valley (43° 37'N, 11° 28'E).
- 216** Not identified.
- 217** For a discussion of the significance of this skull, see p. 249.
- 218** The Manatee (*Trichechus*).
- 219** May be a place-name or personal name; not clear from context.
- 220** Obsolete name for Leghorn, port on the coast S. of the Arno estuary.
- 221** 'Notice on the Megalosaurus, or Great Fossil Lizard of Stonesfield.' *Trans. geol. Soc. Lond.* (2) 1 1824: 390–396.
- 222** Not identified.
- 223** *Reliquiae Diluvianae; or, Observations on Organic Remains Attesting to the Action of an Universal Deluge*. London. (1st edn. 1823). Pentland's use of the word 'new' is curious: perhaps he considered as first edition Buckland's earlier *Vindiciae Geologicae* (Oxford, 1820), which was indeed a sort of forerunner of the later work, but it is equally possible that Pentland may have been referring to a projected second volume of the *Reliquiae*, for which Buckland was unquestionably preparing at that time. In the *Reliquiae diluvianae* (pp. 26, 101, 149–150) Buckland quoted, and ascribed to Pentland, a great deal of data on Italian fossil mammals and on the Val d'Arno, in part duplicating the details given in this letter to Cuvier; clearly, therefore, their correspondence continued for some time after the last letter here transcribed, but none of these later letters has been located by us.
- 224** Pentland certainly did not present this collection to the British Museum, nor does he seem to have presented it to the Geological Society of London.
- 225** Almost certainly Mrs S[arah] Lee. Mrs Lee was earlier the wife of T. Edward Bowditch, who, after earlier travels in Africa, spent four years (commencing in 1819) studying in Cuvier's library and collection in preparation for a second African journey, during which he died. His wife remained a close friend of the Cuviers and was [ultimately] the author of *Memoirs of Baron Cuvier* (New York & London: Harper 1833, 197 pp.).
- 226** Presumably G. B. Brocchi's *Conchologia Fossile Subapennina* (2 vols., 1814) which Pentland may well have obtained from Italy for Christie.
- 227** Despite this pessimistic comment the Société Géologique de France, to which Pentland is unquestionably referring, was a healthy infant and flourishes to this day!
- 228** Jane Franklin, née Griffin (1792–1875), Franklin's second wife, whom he married in 1828 and who later became famous for her efforts to stimulate searches for her lost husband.
- 229** Edmé-François Jomard (1777–?), distinguished French archaeologist and geographer.
- 230** George Samuel Perrottet (1793–1870), an English botanist who certainly travelled extensively in Asia, Africa and the Caribbean and may well have visited South America. Specimens from his collection survive in the herbarium of the British Museum (Natural History).

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